

DEPARTMENT OF ENERGY

ACCOUNTABILITY REPORT

FISCAL YEAR 1999

February 2000

Contents

Message from the Secretary

Overview

DOE at a Glance	1
Energy Resources	5
National Security	11
Environmental Quality	21
Science and Technology	27
Corporate Management	33
Status of Year 2000 Actions	41
Management's Response to Inspector General Audit Reports	42
Summary of Departmental Challenges	43
Message from the Chief Financial Officer	44
Financial Overview	45

Appendices

Inspector General's Audit Report	53
Memorandum from the Inspector General	
Report on Financial Statements	
Report on the Internal Controls	
Report on Compliance with Laws and Regulations	
Principal Financial Statements	77
Required Supplemental Financial Information	123
Detailed Performance Results	131
Mapping of Legal Requirements	
Reference Index	

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Contents

Message from the Secretary

Overview

DOE at a Glance	5
Energy Resources	8
National Security	13
Environmental Quality	21
Science and Technology	27
Corporate Management	33
Status of Year 2000 Actions	41
Management's Response to Inspector General Audit Reports	42
Summary of Departmental Challenges	43
Message from the Chief Financial Officer	44
Financial Overview	45

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Inspector General's Audit Report	
Memorandum from the Inspector General	55
Report on Financial Statements	57
Report on the Internal Controls	61
Report on Compliance with Laws and Regulations	73
Principal Financial Statements	77
Required Supplemental Financial Information	124
Detailed Performance Results	131
Mapping of Legal Requirements	172
Reference Index	173

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More information relating the Department of Energy is available at www.doe.gov.



Message From the Secretary

I am pleased to present the Department of Energy's Fiscal Year 1999 Accountability Report. The Report integrates information on our operational performance and financial activities. It is a progress report describing our achievements and the challenges we face. It demonstrates our strong commitment to stewardship and accountability in administering some of the Nation's most important programs on behalf of the American people.



The Department of Energy's responsibilities are important: protecting our national security; advancing the frontiers of science and technology; helping to solve the challenge of global climate change; cleaning up waste sites throughout the country; working to bring down the cost of electricity to the American people; and ensuring a balanced energy portfolio for our Nation. Our work spans a broad range of activities where we are making advances on a number of fronts.

Our scientific research is unlocking the mysteries of the quark, the building block of matter. We are mapping the labyrinth that is the human genome, the building block of life. We have joined hands with Russia to ensure our joint national security, working so that nuclear materials stay out of the hands of terrorists. And, we are on the forefront of environmental remediation science, cleaning up the Nation's cold war legacy of nuclear waste and permanently isolating it from people and the environment.

My objective is that the Department administer its programs in the most efficient and economic manner possible. To accomplish this, we rely on our system of management controls. We believe these controls are working effectively. However, we have identified ten areas, such as security and project management, where improvements can and should be made. This report describes these areas as Departmental challenges and explains the actions we are taking to remedy them.

I am pleased to report that our Fiscal Year 1999 financial statements received an unqualified opinion from the auditors. Last year, in their audit of the Department's Fiscal Year 1998 statements, the Office of Inspector General identified needed improvements in our processes for estimating the liability associated with the cleanup of the nuclear weapons complex. Our efforts in 1999 to ensure the accuracy and completeness of the environmental remediation liability estimate in this year's statements were successful.

Meeting the needs of the American people is foremost for all of us at the Department of Energy. We have set ambitious goals and are prepared to meet the challenges of today and the future.

A handwritten signature in black ink that reads "Bill Richardson". The signature is fluid and cursive, with a long, sweeping underline.

Bill Richardson

Overview

DOE at a Glance

The Department of Energy provides innovative science and technology solutions to some of the foremost energy, national security, environmental, and scientific challenges facing our Nation.

Our History

The Department of Energy was created as a cabinet-level agency in 1977; yet, its history can be traced back to the days of the Manhattan Project in 1942, when the Manhattan Engineering District was established to manage the development of the first atomic bombs. After World War II, Congress created the Atomic Energy Commission to direct the development of nuclear weapons as well as to initiate the commercialization of nuclear power and regulate that growing industry.



The first atom bombs were developed by the Manhattan Engineering District. Development of nuclear weapons is now the responsibility of DOE.

In 1975, Congress replaced the Atomic Energy Commission with two separate agencies: the Nuclear Regulatory Commission, which was assigned the regulatory functions, and the Energy Research and Development Administration, created to manage the nuclear activities and energy programs. During this period, the United States faced an energy crisis that emphasized the need for one cabinet-level department to coordinate all Federal energy policy and programs. Congress created the Department of Energy in October 1977, bringing together many important functions under one agency.

DOE Today

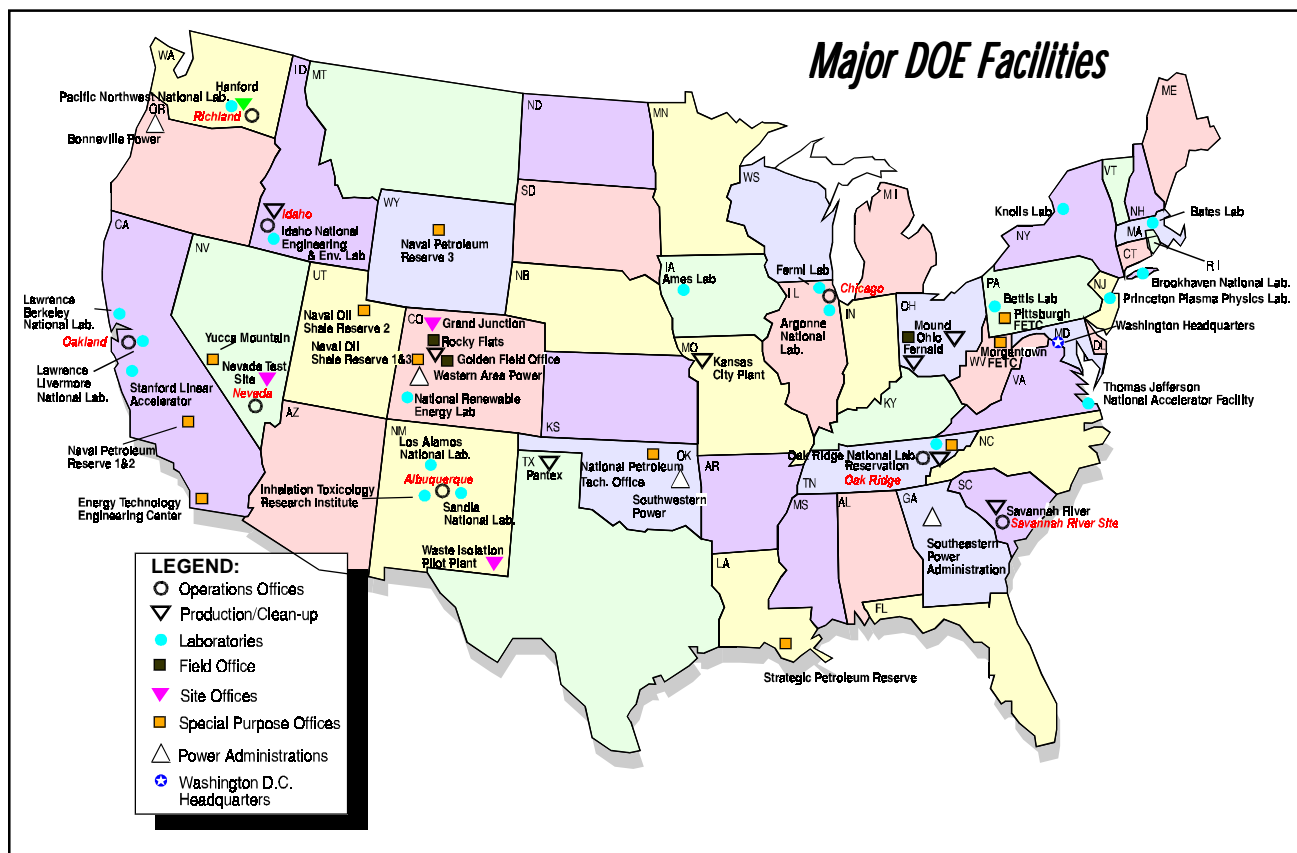
Today, the Department manages a vast array of energy programs and a nationwide complex of headquarters and field organizations, national laboratories, power marketing administrations, and special-purpose offices. Through our leadership in science and technology, we are working to advance the Nation's energy, environmental, economic, and national security. We are accomplishing this within our framework of four business lines, which, in turn, are supported by our corporate management function:

- **Energy Resources Business Line**—We are working to ensure that the United States has a flexible, clean, efficient, and equitable system of energy supply with minimal vulnerability to disruption.

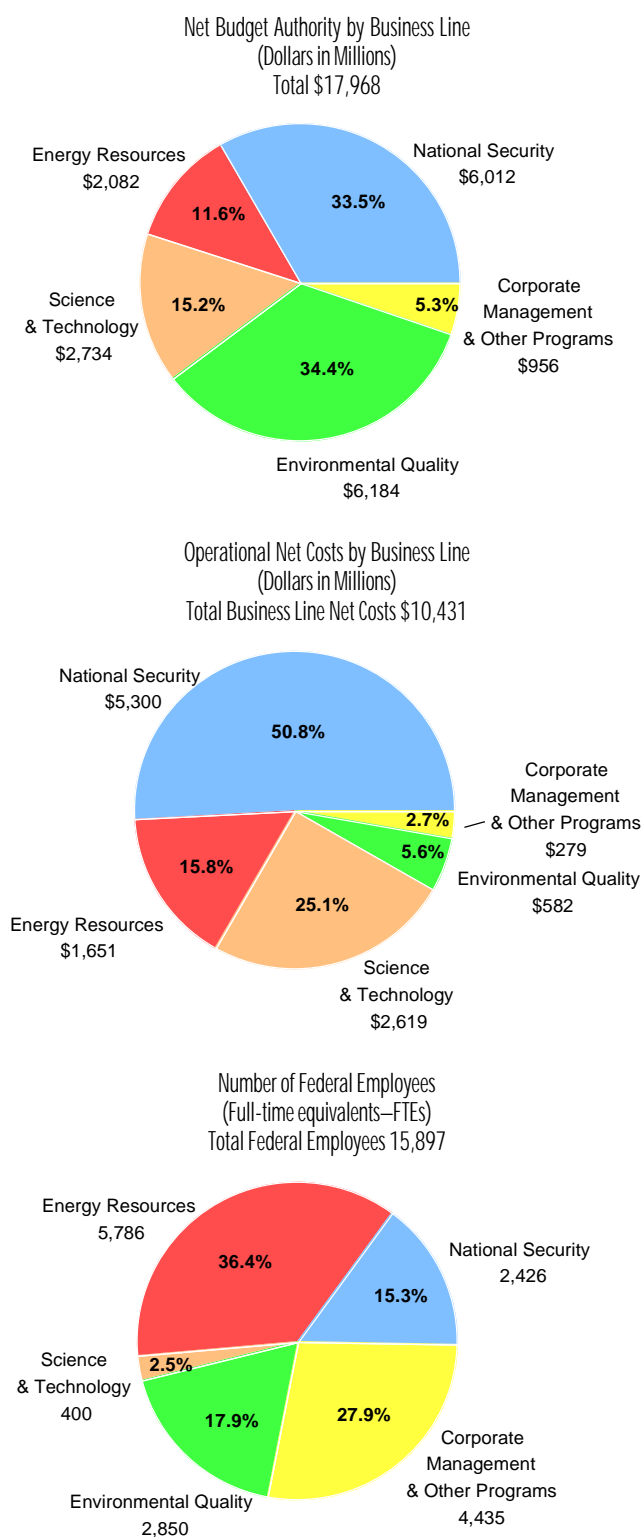


Today, we utilize technical and scientific knowledge to ensure the Nation's energy security, maintain the safety and reliability of our nuclear weapons stockpile, safely clean up the environment from the legacy of the cold war, and develop breakthroughs in science and technology.

- **National Security Business Line**—We are working to reduce global nuclear danger through our national security, nuclear safety, and nonproliferation activities.
- **Environmental Quality Business Line**—We are a world leader in environmental restoration, nuclear materials stabilization, waste management, and pollution prevention.
- **Science and Technology Business Line**—We are a major partner in world-class science and technology through our national laboratories, research centers, university research, and educational and information dissemination programs.
- **Corporate Management Function**—Our four business lines are supported by functions that are critical to all of them: safety and health, good business practices, and communication and trust.



Our FY 1999 Resources



Note: The costs shown in this report differ from budgeted amounts due to items such as: environmental cleanup costs that are not included in current year because they were accrued in prior years; expenditures for large acquisitions that are recorded as assets, not costs; depreciation and other costs that do not require funds; and the allocation of overhead to business lines.

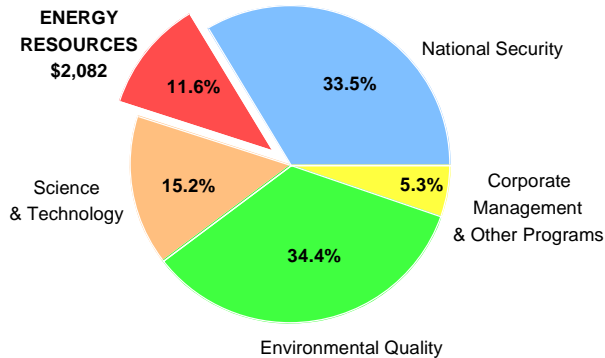
Report Background

In the past few years, the President and the Congress have enacted laws and set policies to reform management throughout the Government. Paramount among these is the Government Performance and Results Act of 1993, which, among other things, requires agencies to establish measurable annual performance goals and then report results. The Secretary's 1999 Performance Agreement with the President established performance objectives for the Department, as well as measures with which to gauge whether the Department's 1999 actions were successful. Summary information on those objectives and measures is included in the Overview section of this report. Complete, more detailed data is contained in the supplemental information at the back of the report.

Although this is technically the first annual report on performance results required by the Government Performance and Results Act, the Department has been reporting in accordance with the law since 1996. Other laws, such as the Chief Financial Officers Act of 1990, the Government Management Reform Act of 1994, and the Clinger-Cohen Act of 1996, call for additional management activities and reports. This document meets these reporting requirements as well as the previous reporting requirements of the Department of Energy Organization Act of 1977 and the Federal Managers' Financial Integrity Act of 1982.

Energy Resources

FY 1999 Net Budget Authority by Business Line
(Dollars in Millions)
Total \$17,968



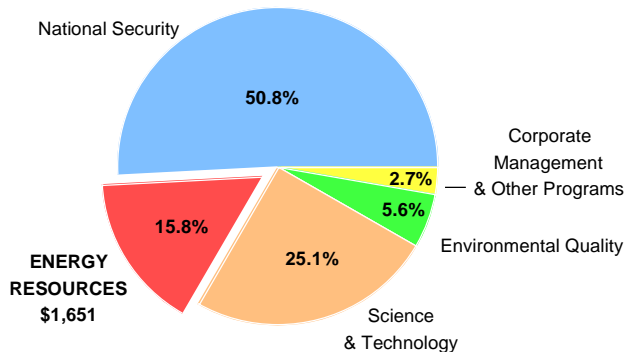
The Department of Energy promotes secure, competitive, and environmentally responsible energy systems that serve the needs of the public

Our Nation's economic prosperity depends on the abundance of energy resources, and a clean environment is dependent upon energy efficiency and clean production technologies. The Department's role is to facilitate the efficient transition to a long-term pattern of energy supply and use that is consistent with the Nation's goals of national security, environmental responsibility, and economic prosperity.

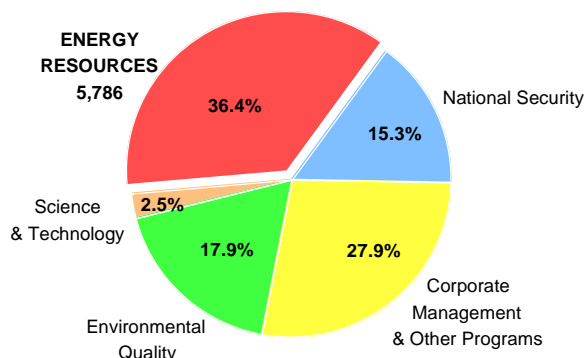
In our Energy Resources business line, we are working to:

- Reduce the vulnerability of the U.S. economy to disruptions in energy supplies.
- Ensure that a competitive electricity generation industry is in place that can deliver adequate and affordable supplies with reduced environmental impact.
- Increase the efficiency and productivity of energy use, while limiting environmental impacts.
- Support U.S. energy, environmental, and economic interests in global markets.
- Carry out information collection, analysis, and research that will facilitate development of informed positions on long-term energy supply and use alternatives.

FY 1999 Operational Net Costs by Business Line
(Dollars in Millions)
Total Business Line Net Costs \$10,431



FY 1999 Number of Federal Employees
(Full-time equivalents—FTEs)
Total Federal Employees 15,897



Objective 1: Reduce the vulnerability of the U.S. economy to disruptions in energy supplies.

The primary thrust in the Department's actions to reduce U.S. vulnerability to energy supply disruptions is to improve the utilization of our domestic resources and minimize our reliance on foreign supplies.

One action we are taking is to boost the Nation's production of domestic oil, which has been on the decline. Our goal is to end the decline before 2005. Working toward this long-term goal, in FY 1999 the Department demonstrated four advanced production enhancement technologies to boost the productivity of mature oil reservoirs. These new technologies added 46 million barrels to the Nation's domestic oil reserves in FY 1999, exceeding our goal of 30 million barrels. Our ultimate goal is to add 190 million barrels to the U.S. domestic oil reserves.



Photo of a Strategic Petroleum Reserve facility. The Reserve contains 565 million barrels of oil as a contingency to disruptions in international energy supplies.

Another action we are taking is to upgrade the Strategic Petroleum Reserve that the Department maintains to deter and respond to international oil supply disruptions. In FY 1999, we continued our long-range efforts to extend the life of the Reserve. On schedule, we have now completed 96 percent of the planned work. When complete, this life extension project will increase our sustained oil drawdown capability to 4.1 million barrels per day, compared with 3.7 million in 1997. Completion of the life extension upgrades will enable the Strategic Petroleum Reserve to maintain high reliability and availability of critical systems to the year 2025.

Another thrust of the actions we are taking to reduce our vulnerability to disruptions in foreign energy supplies is to develop alternative transportation fuels and more efficient vehicles that can reduce our reliance on oil imports. Toward this end, in FY 1999 we began work with an industrial partner to demonstrate a first-of-a-kind technology for producing ethanol from agricultural crop waste. However, due to a delay in financing, we did not meet our FY 1999 goal to complete site preparation and begin construction of a facility. Also in FY 1999, we built a single-cylinder proof-of-concept diesel engine that delivers up to 53 percent efficiency, slightly below our goal of 55 percent efficiency.

In addition, we are taking steps to avoid domestic energy disruptions and ensure that our own sources of energy are reliable. In FY 1999, our objective was for each of the Department's four Power Marketing Administrations to receive a monthly "Pass" rating against the North American Electric Reliability Council performance standard. This FY 1999 objective was met.

Another thrust of our efforts to minimize disruptions in our energy supply is to diversify the international supply of oil and gas. To this end, we are working with foreign governments to establish energy initiatives that will encourage development of a broad portfolio of fuel supplies. During FY 1999, we met our goal to foster energy development activities by working with Russia, the Ukraine, and Saudi Arabia.

We believe the Department is making strides toward mitigating the potential impacts of disruptions in our energy supplies. While we are encountering some areas of unanticipated difficulties, overall we successfully accomplished our FY 1999 goals.



The Department's Power Marketing Administrations market electricity generated by hydroelectric power plants operated by the U.S. Army Corps of Engineers.

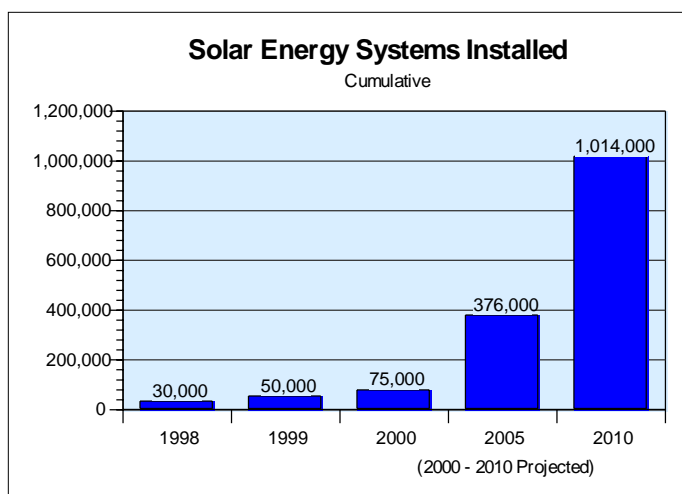
Objective 2: Ensure a competitive electricity generation industry is in place that can deliver adequate and affordable supplies with reduced environmental impact.

The Department is working to ensure that there are increased choices for consumers in the Nation's electricity generation industry. At the same time, we are working to reduce the environmental impacts of the industry.

One action we are taking is to establish a more open, competitive, and reliable electric system. During FY 1999, we furthered this cause by issuing, as planned, a revised Administration proposal on electric utility restructuring. The proposal and supporting economic analysis are a catalyst for reaching consensus and taking future actions to make this a more competitive industry.

Another of the Department's strategies is to develop renewable technologies capable of doubling non-hydroelectric generating capacity by 2010. In this vein, we continued to support the President's Million Solar Roofs Initiative and in FY 1999 installed 20,000 solar energy systems. This exceeds our goal of 15,000 and brings the total number of systems installed to 50,000.

In addition, we completed the design of a power plant modification that will utilize agricultural crop waste in conjunction with coal. Meeting our FY 1999 goal, the construction of two facilities has been completed for long-term demonstration testing.



We are also aggressively pursuing methods of reducing emissions from existing fossil fuel power plants and developing clean, high-efficiency fossil fueled power plants for the 21st century. In FY 1999, we met our goal and completed testing of the first commercial-sized fuel cell suitable for advanced high-efficiency electrical generation. We also partially completed the full-scale component testing of two advanced utility-scale turbines with more than 60

percent efficiency (new plants are currently about 55 percent efficient) and with ultra-low emissions. We had planned to fully complete the testing in FY 1999, but encountered unexpected delays.

Finally, in FY 1999, the Department initiated a peer-reviewed R&D program aimed at finding innovative ideas and applications for nuclear science and technology. Nuclear power currently provides 20 percent of our Nation's electricity without any harmful greenhouse gas emissions, but many of these plants face retirement over the next 25 years. The Department's new nuclear energy research initiative may provide the technologies required to enable current plants to operate more efficiently and last longer, and may lead to the next generation of clean and environmentally friendly domestic nuclear power plants.

We believe the Department is successfully on track toward meeting its long-term objective.

Objective 3: Increase the efficiency and productivity of energy use, while limiting environmental impacts.

Our activities to increase the efficiency and productivity of energy use, with minimal impact to the environment, span a wide range of energy consumption, including transportation, buildings, and manufacturing.

The "vehicles of the future" program is developing and deploying vehicles, fuels, and systems to improve energy efficiency. During FY 1999, the Department worked with industry and other Federal agencies as planned to develop technical "roadmaps" to integrate fuels and lubricants research and development with development of engine and emissions treatment technologies.



The Department is contributing to the Administration's Partnership for a New Generation of Vehicles goal to develop, by 2004, prototype mid-sized cars capable of achieving 80 miles per gallon of gasoline. These cars will reduce emissions by two-thirds compared to today's new car average without compromising safety, comfort or cost.

In the buildings sector, our goal is to improve the energy efficiency of the existing U.S. building stock and increase the efficiency of new homes. In FY 1999, DOE with its industrial partners completed construction of more than 400 energy-efficient homes, bringing the total to 1,000 and exceeding the current-year goal we had established. These homes were designed to save 50 percent of energy use for heating, cooling, and hot water at no incremental costs. In addition, we provided grants to States for the purpose of weatherizing existing homes. In FY 1999, we exceeded our goal by weatherizing approximately 68,000 homes, bringing the total to 4.7 million.

Based on the Department's focused approach and the public's awareness of the need for energy efficiency, the Nation is becoming an efficient energy user. We believe our FY 1999 actions were successful.

Objective 4: Support U.S. energy, environmental, and economic interests in global markets.

The Department's efforts to support U.S. interests globally range from climate control to developing international markets.

We continue to work for global climate change and energy-related greenhouse gas reductions. In FY 1999, we supported Administration efforts to further develop a global agreement to reduce greenhouse gas emissions and to develop domestic policies that would minimize the economic impacts of such efforts on the U.S. economy and energy sector. Our goal to develop proposed guidelines for implementing the flexible, market-based mechanisms for reducing emissions envisioned at the Kyoto Conference of the Parties to the U.N. Framework Convention on Climate Change were not quite met during the year. Work in this area will continue and accelerate in FY 2000. However, we did engage in other activities to lead the U.S. technology and climate change strategy development and implementation, meeting our FY 1999 goal in that area.

In the international arena, the Department took actions to cooperate with foreign governments to develop open energy markets. In FY 1999, we successfully accomplished our immediate goal by establishing initiatives with the APEC countries, China, Sub-Sahara Africa, and Russia.

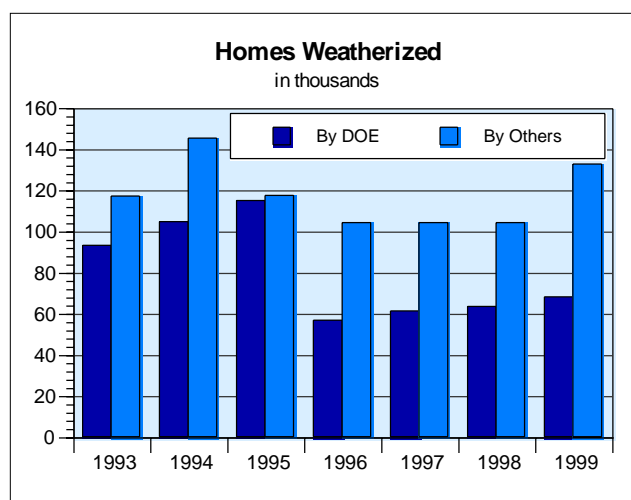
We believe our efforts to support energy, environmental, and economic interests abroad were successful in FY 1999.

Objective 5: Carry out information collection, analysis, and research that will facilitate development of informed positions on long-term energy supply and use alternatives.

The Department's expertise in energy systems and access to energy-related information are shared with our stakeholders to assist in making decisions. As planned, in FY 1999 the Department published its *Annual Energy Outlook* forecasting energy supply and consumption through the year 2020.

In addition to forecasting future energy supply and consumption, the Department is also carrying out research and analysis to develop innovative options for the 21st century energy markets. In FY 1999, we accomplished our goal to initiate a Department-wide program to develop lower-cost, environmentally acceptable approaches to achieve carbon sequestration. One outcome of this program is the selection of six concepts for further development that propose different ways to capture and store carbon dioxide.

We believe that the actions we have taken successfully met our goals for FY 1999.



Carbon Sequestration

What is Carbon Sequestration?

Carbon sequestration is the capture and secure storage of carbon that would otherwise be emitted to or remain in the atmosphere as carbon dioxide.

Why Are We Studying Carbon Sequestration?

Predictions of global energy use in the next century suggest a continued increase in carbon emissions. Although the effects of increased carbon dioxide levels on global climate are uncertain, there is scientific consensus that a high level of atmospheric concentrations could have a variety of serious environmental consequences.

National Security

The Department of Energy supports national security, promotes international nuclear safety, and reduces the global danger from weapons of mass destruction

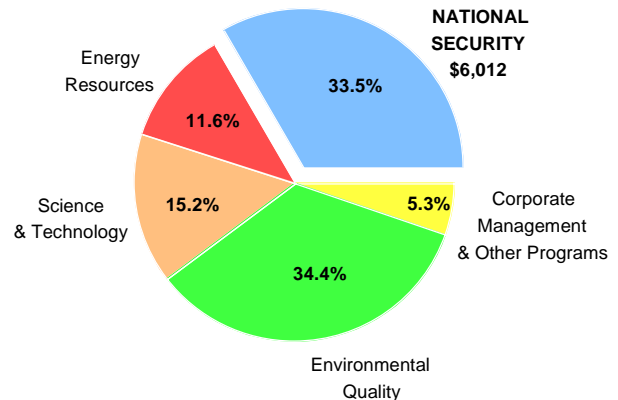
The Department of Energy and its predecessor agencies have long played a critical role in our Nation's national security mission. DOE's activities in coordination with the Department of Defense (DOD) and other agencies with a national security mission help to ensure that we live in a safe and secure world.

In our National Security business line, we are working to:

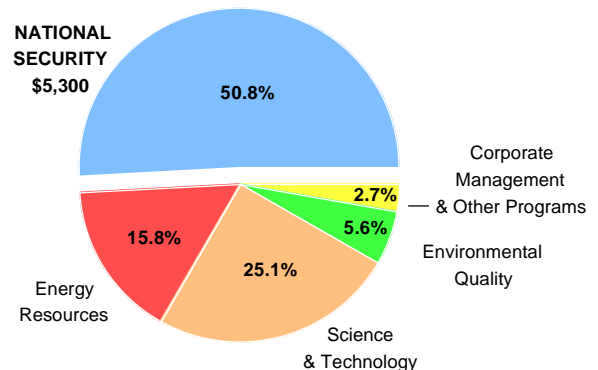
- Maintain confidence in the safety, reliability, and performance of the nuclear weapons stockpile without nuclear testing.
- Replace nuclear testing with a Stockpile Stewardship Program.
- Ensure the vitality of DOE's national security enterprise.
- Reduce nuclear weapons stockpiles and the proliferation threat caused by the possible diversion of nuclear materials.
- Continue leadership in policy support and technology development for international arms control and nonproliferation efforts.
- Meet national security requirements for naval nuclear propulsion and for other advanced nuclear power systems.
- Improve international nuclear safety.

We have witnessed profound changes in U.S. national security policies in the post-Cold War era, but our commitment to a secure national defense remains as strong as ever. The nuclear deterrent remains a cornerstone of our national security policy. However, the nuclear deterrent is represented by a smaller, aging weapons stockpile maintained without underground testing. Our stockpile stewardship programs are utilizing

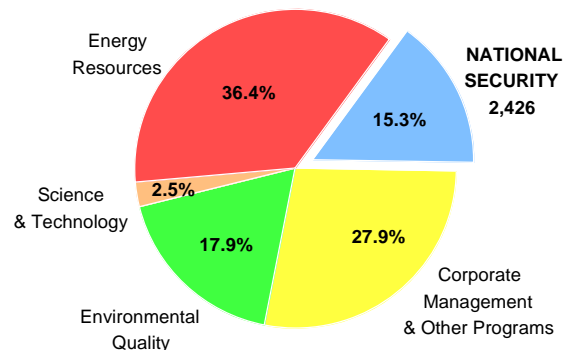
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advances in science and technology to ensure the safety and reliability of the stockpile. International cooperative efforts improve the safety and minimize the risks of aging nuclear power plants in the nations of the former Soviet Union.

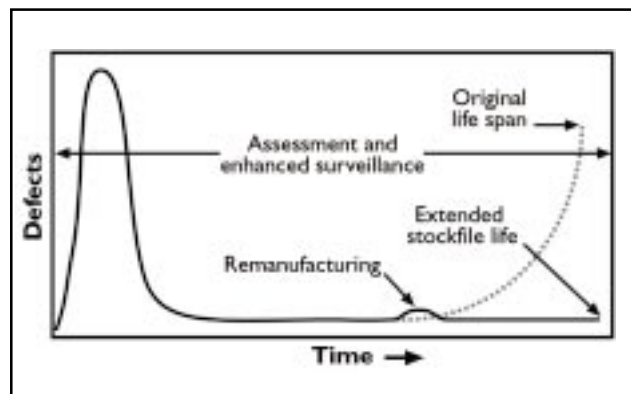
Objective 1: Maintain confidence in the safety, reliability, and performance of the nuclear weapons stockpile without nuclear testing.

In pursuit of the Comprehensive Test Ban Treaty, President Clinton directed the establishment of an annual review and certification process of the safety, reliability, and performance of the nuclear weapons stockpile. The annual review and certification process is essential to measuring the Department's success in fulfilling its commitment to maintaining the enduring stockpile. In FY 1999, the Department met its goal by initiating the fourth annual certification process. Active and inactive weapons systems were reviewed by the Department's national weapons laboratories and joint Project Officers Groups led by the Department of Defense. Annual Certification Technical Reports on each system were completed and final reports provided to the Secretaries of Energy and Defense in July 1999.

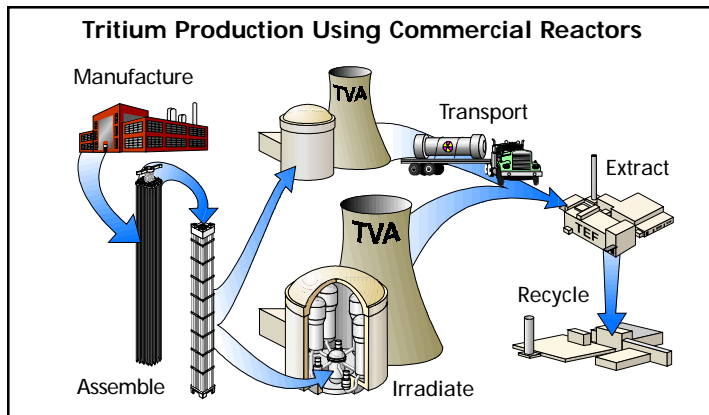
DOE's maintenance of the nuclear stockpile includes the surveillance, alteration, and modification of stockpile weapons. Surveillance is essential to assess the safety and reliability of the Nation's stockpile. Alterations and modifications are critical to upgrade the stockpile to meet higher safety standards, replace faulty components, meet changed military requirements, or extend the life of the weapon. In FY 1999, there were no requirements for modification, but DOE conducted alterations of 11 weapons systems. DOE met the annual schedule for 9 of the 11 weapon alterations, nearly accomplishing its FY 1999 goal to meet all alteration and modification schedules developed jointly with DOD. For the remaining two alterations, recovery schedules have been developed with DOD, and DOE is meeting the new revised schedule.

In order to maintain confidence in the nuclear weapons stockpile, the Department has to provide a reliable source of tritium, a radioactive isotope of hydrogen necessary for the proper function of all U.S. nuclear weapons. Because tritium decays at about 5 percent per year, it must be replaced in weapons to ensure their continued reliability. The United States has not produced new tritium for military use for the past 11 years and has used recycled tritium from dismantled weapons to meet stockpile requirements. The current source of tritium is dwindling and will be sufficient to meet requirements only until 2005, after which the planned 5-year tritium reserve will be impacted.

Thus, it is necessary that a new domestic source be established. DOE employed a dual-track strategy to meet new tritium production requirements. This strategy included contracting for irradiation services from existing commercial reactors to produce tritium and the development of an accelerator as a "backup" technology. DOE has completed a number of significant milestone activities on both tracks of the strategy and has met the FY 1999 performance



The typical life cycle of complex manufactured systems follows a path through initial defects, useful life, and eventual wearout. The Stockpile Stewardship Program will extend the useful life of U.S. stockpile warheads through enhanced surveillance, assessment, and remanufacturing.



Cycle of tritium production utilizing commercial service with DOE extraction and recycling facilities and capabilities

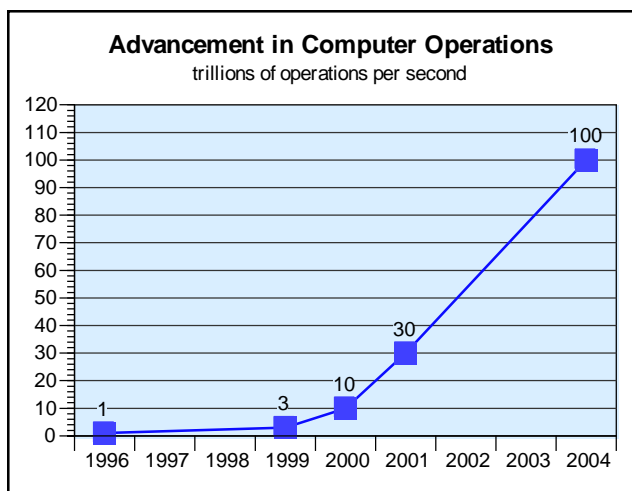
goals it established. In December 1998, the Department announced the preference for the commercial light-water reactor as the primary technology for production of tritium, with development and preliminary design of the accelerator as backup technology. In May 1999, the Department announced that tritium will be produced in the Watts Bar and Sequoyah light-water reactors operated by the Tennessee Valley Authority (TVA). DOE also announced that it will construct a new Tritium Extraction Facility at the Savannah River Site. At the end of FY 1999, DOE and TVA reached an agreement in principle for irradiation services, but TVA delayed its formal signing of the agreement until it

could convene a full board of directors meeting after two new directors were confirmed by the Senate. The full TVA board of directors confirmed the agreement in November 1999. This delayed the initiation of the process to amend the operating licenses of TVA's reactors to permit tritium production. However, the delay is not expected to impact the start of tritium production in FY 2003.

Overall, we nearly met the FY 1999 goals we established to meet our long-term objective. Although we have been successful in our certification and planning for future tritium production, we have experienced difficulties related to weapons alterations.

Objective 2: Replace nuclear testing with a Stockpile Stewardship Program.

Since the United States stopped nuclear testing in 1992, the Department of Energy has been working on replacing underground testing with a science-based program of stockpile stewardship.



The Accelerated Strategic Computing Initiative is a program being developed to help maintain our existing aging stockpile through advanced simulation and modeling. In FY 1997, a major milestone was achieved with the installation of a 1 trillion operations per second computer system. Further advancements were made in FY 1998 with the development of a 3 trillion operations per second computer system that ran weapons simulations that were larger and more complex than ever before. In FY 1999, the Department exceeded its goal of demonstrating a 3 trillion operations per second computer system. At the end of FY 1999, the Accelerated Strategic Computing Initiative's Blue-Pacific system was operating at 3.89 trillion operations per second, approximately 30 percent faster than the Department's FY 1999 performance goal.

Another thrust of our efforts in the Stockpile Stewardship Program is to develop new experimental capabilities for understanding weapons science. The

National Ignition Facility, an experimental physics facility meeting this purpose, is now under construction at the Lawrence Livermore National Laboratory in California.

The Department's FY 1999 goal was to continue construction of the facility according to its Project Execution Plan schedules. Performance in meeting this goal during FY 1999 was below expectations. Delays in completing the design and support equipment, coupled with additional costs for assembly of the laser infrastructure, had direct impacts on the project cost and schedule. A new baseline will be approved by the Secretary of Energy by June 2000. In October 1999, the Secretary of Energy issued a six-point plan to get the project back on track at the least cost and schedule impact.

Another focus of our stockpile stewardship efforts is to conduct experiments to advance our understanding of the fundamental characteristics of weapons behavior. We met our goal in FY 1999 and conducted three subcritical experiments that provided valuable scientific information about the behavior of nuclear materials during the implosion of a nuclear weapon.

Although we had considerable success during the year in our Accelerated Strategic Computing Initiative and weapons experiments, we were not fully successful in achieving our FY 1999 goals due to the delay being encountered in the National Ignition Facility project.

Objective 3: Ensure the vitality of DOE's national security enterprise.

Maintaining the Department's national security enterprise is a multifaceted endeavor. It involves modernizing our facilities; retaining the capability to resume underground nuclear testing; providing a radiological emergency response capability; and protecting our nuclear materials, information, and technologies.

Meeting national security requirements in this post-Cold War era required the Department to reevaluate its nuclear weapons complex. Downsizing and modernization activities at several DOE sites will ensure that the U.S. maintains an appropriately sized, cost-effective, safe, secure, and environmentally sound national security enterprise. The Department strives to ensure that all facilities required for successful achievement of the Stockpile Stewardship Plan remain operational. Two key activities related to providing operational production facilities were underway in FY 1999: resumption of enriched uranium operations at the Y-12 Plant in Oak Ridge and the establishment of a Pit Production Program at the Los Alamos National Laboratory. The first phase of the resumption of the enriched uranium operations at the Y-12 Plant was completed in December 1998. The second and final phase of the resumption restores enriched uranium metal production capabilities and chemical recovery processing. Scheduled activities in the final phase are significantly behind the FY 1999 completion schedule due to inadequate design and project controls. The schedules to complete the remaining tasks are currently under review.

In an effort to reestablish the pit production capabilities at the Los Alamos National Laboratory, the Chemistry and Metallurgy Research Upgrades project was re-baselined, focusing resources on those upgrades necessary to ensure operation of the facility for the next 10 years. In addition, the Depart-

ment began pre-conceptual planning of the Transition Manufacturing and Safety Equipment project to later replace the capabilities provided by the Chemical and Metallurgy Research facility. The new facility will provide urgent and near-term process, equipment, and infrastructure necessary for fabrication and certification of a War Reserve quality pit. Construction of the project is scheduled to begin in FY 2002.

As part of the Department's activities to downsize and modernize its nuclear weapons complex, it committed to completing the shipment of plutonium pits from the Rocky Flats Environmental Technology Site to our Pantex Plant in FY 1999. The Department successfully completed shipments of all surplus plutonium pits to Pantex in April 1999.

In FY 1999, the Department met its goal to maintain the capability to resume underground nuclear testing, consistent with Presidential direction. Maintaining the capability to resume underground testing requires DOE to maintain test facilities and equipment at the Nevada Test Site, nuclear testing skills of personnel at both the test site and the nuclear weapons laboratories, and access to experienced personnel through knowledge capture and archiving. High-explosive and subcritical experiments conducted at the Nevada Test Site and specially designed test readiness exercises maintained test readiness skills. During FY 1999, 19 high-explosive experiments and three sub-critical

Departmental Challenge: Security

The Department is reforming its security and counterintelligence programs in response to Presidential mandates, espionage allegations, and numerous internal and external reviews. It is clear that over the past several decades, security and counterintelligence have not been given the necessary priority and attention within the Department and its laboratories. The weaknesses include not only counterintelligence but also cybersecurity, physical security, personnel security, and information security programs. In response to these weaknesses, the Secretary of Energy issued a ten-point security reform package in May of 1999. This plan gives the Department the tools and

authority necessary to detect security infractions, correct institutional problems, and protect America's nuclear secrets. Prior to that, in February 1999, the Secretary approved a Counterintelligence Implementation Plan to put into effect reforms required by Presidential Directive 61. The plan includes measures to develop effective monitoring of foreign visitors to DOE facilities, the staffing of field counterintelligence programs by experienced professionals, the development of a counterintelligence polygraph program, enhanced awareness training, and a robust analytic and investigative capability to assess the foreign intelligence threat to DOE and effectively detect and deter hostile intelligence activities. The security and counterintelli-

gence plans establish senior management attention and accountability for DOE's security and counterintelligence programs.

In addition, the National Defense Authorization Act for FY 2000 established a National Nuclear Security Administration within the Department. This agency takes effect on March 1, 2000, and includes security functions transferred from nuclear weapons production facilities and national security laboratories. The Department is committed to resolving the funding, staffing, and organizational issues associated with implementing the new National Nuclear Security Administration in FY 2000.

experiments were conducted at the Nevada Test Site. In addition, a Nuclear Explosive Safety Study exercise was performed at Los Alamos National Laboratory in FY 1999. The Department's archiving program captured on videotape such things as the knowledge and testing experience of personnel, photos, drawings, procedures, nuclear safety studies, containment evaluation plans, and lessons learned. During FY 1999, the Department completed seven videotape modules, and more than 41,000 pages related to underground tests were scanned into the Document Management and Archived Records System.

The Department's Emergency Response Program provides a national capability to respond to any radiological emergency or nuclear accident within the United States and abroad. The Department's Emergency Response Program met its FY 1999 goal by participating in 26 U.S. and overseas exercises and 24 real-world events. Radiation accident management training was provided to 177 health professionals, and there was response to 59 calls for medical assistance.

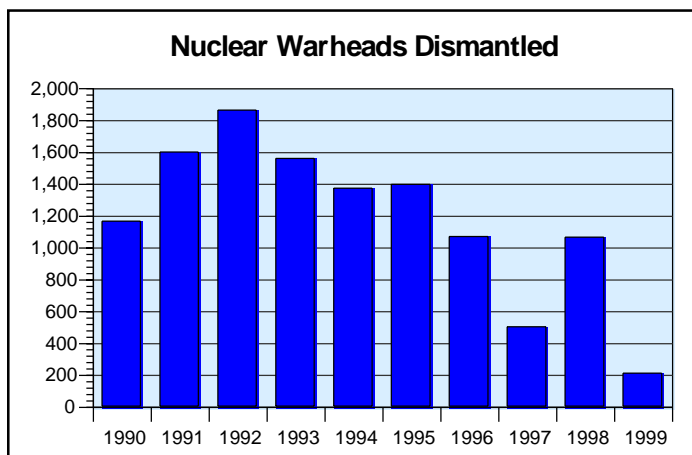
Despite some successes in meeting our goals to ensure the vitality of DOE's national security enterprise, overall our FY 1999 performance was below expectations.

Objective 4: Reduce nuclear weapons stockpiles and the proliferation threat caused by the possible diversion of nuclear materials.

The Department takes an active role in reducing the global danger from weapons of mass destruction by reducing inventories of surplus weapons-usable fissile materials worldwide. Such efforts entail reducing our own weapons stockpile as well as international cooperation to dispose of surplus fissile materials, placing excess materials under safeguards of the International Atomic Energy Agency, and reducing the demand for highly enriched uranium in civilian programs.

Since 1993, the U.S. has dismantled a total of 7,149 nuclear warheads that had been removed from the U.S. nuclear weapons stockpile. During FY 1999, 207 nuclear warheads were dismantled, which was below our performance goal of 275. Dismantlement of the W69 Short-Range Attack Missile warhead was completed; however, dismantlement of the W79 Artillery-Fired Atomic Projectile warhead was at a rate lower than expected due to technical difficulties. Facility modifications and dismantling of the W56 Minuteman II warhead were also delayed by technical difficulties. The Department anticipates that the backlog of retired warheads to be dismantled will be completed in FY 2005, not FY 2003 as previously planned.

The Department is taking aggressive action to reduce our nuclear weapons stockpile and the nonproliferation threat. Overall, we believe our FY 1999 actions were successful in achieving our goals.



Departmental Challenge: Surplus Fissile Materials

The United States and Russia have extensive inventories of fissile nuclear materials that are no longer needed for defense purposes due to the end of the Cold War. A danger exists in the potential global proliferation of nuclear weapons and in the potential for environmental, safety, and health consequences if surplus fissile nuclear materials are not properly managed. The Department could save storage, security, maintenance, and handling costs associated with these assets.

We have implemented various phases of the Department's plan to dispose of surplus fissile materials to reduce the proliferation threat and handling costs. As planned, in FY 1999 the Department made available the second installment (7MT) of surplus highly

enriched uranium to the United States Enrichment Corporation (USEC). A total of 50 metric tons will be made available to USEC for down blending and subsequent sale over the next 6 years. We also negotiated an agreement with the Tennessee Valley Authority for the disposition of off-specification highly enriched uranium.

Regarding surplus plutonium, we are continuing to pursue a hybrid strategy that calls for immobilization of some plutonium in ceramic form and burning of some as mixed oxide fuel in existing, domestic commercial reactors. During FY 1999 and early 2000, we completed the final environmental impact statement and issued a Record of Decision on siting plutonium disposition facilities and initiated design of two disposition facilities: the Pit Disassembly and Conversion

Facility and the Mixed Oxide Fuel Fabrication Facility.

Formal negotiations with Russia on a bilateral agreement for the disposition of surplus plutonium commenced during the year with seven negotiation sessions being held, exceeding our goal. An agreement is expected in FY 2000. However, even though we are proceeding with the design phase of the plutonium disposition facilities, the Department still holds firm its decision not to construct any new facilities for the disposition of surplus plutonium until an accord is attained.

With the implementation of various phases of DOE's plan for disposing of surplus fissile materials, we are attaining our goal to reduce the nuclear danger and threat of

Objective 5: Continue leadership in policy support and technology development for international arms control and nonproliferation efforts.

Ensuring our national security requires much more than maintaining a strong nuclear deterrent. It also requires that we work on an international scope to minimize the threat of nuclear weapon technology and materials falling into the wrong hands. Our objective is to strengthen the nuclear nonproliferation regime and advance arms control through support of treaties and international agreements. Since the end of the Cold War, an important component of our programs has been our work with states of the former Soviet Union to minimize the risks of proliferation. We have completed many security upgrades at Russian reactor sites and in the Russian infrastructure that supports the manufacture, transportation, and storage of weapons-usable nuclear materials. For example, in FY 1999, DOE and the U.S. Customs Service exceeded expectations by successfully installing nuclear detection equipment at Sheremetyevo International Airport Phase I and Astrakan Seaport. Also in FY 1999, the Department began a site prioritization and selection study as

planned which includes near-term surveying of six Caspian and Black Sea ports for nuclear detection equipment deployment.

In FY 1999, the Department successfully completed development and delivery of two new counter-nuclear-smuggling detection technologies: a portable detector for use in monitoring uranium enrichment levels at blend-down facilities and an algorithm to aid in tracking moving radiation sources.

We believe we have been successful in achieving our FY 1999 goals in this area.

Objective 6: Meet national security requirements for naval nuclear propulsion and for other advanced nuclear power systems.

Due to its nuclear expertise and state-of-the-art nuclear facilities, the Department of Energy is charged with providing the U.S. Navy with safe, militarily effective nuclear propulsion plants and ensuring their continued safe and reliable operation in Navy warships. In FY 1999, development of the next generation reactor for the Navy's New Attack Submarine progressed ahead of schedule. Development and qualification testing is proceeding on components and systems, such as the control drive mechanism units and new concept steam generator to demonstrate design acceptability. The Navy is also developing a new nuclear powered aircraft carrier, including a new propulsion plant.

The goals supporting this strategic objective were met successfully in FY 1999.



The Department develops nuclear propulsion plants for the U.S. Navy and ensures that warships, such as this nuclear-powered guided missile cruiser, are operationally safe and reliable.

Objective 7: Improve international nuclear safety.

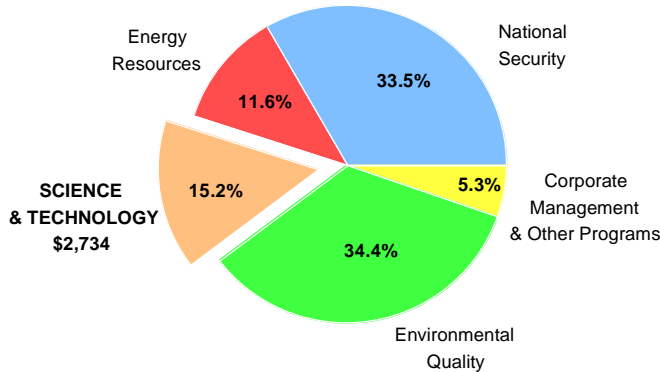
In our endeavor to advance nonproliferation cooperation worldwide, the Department assisted countries of the former Soviet Union in reducing the safety risks from Soviet-designed nuclear power plants and implementing safety programs to meet international safety practices in the nuclear industry. In FY 1999, a new safety system, providing plant operators a tool to safely control the plant in the event of an abnormal situation, was installed at the Novovoronezh plant in Russia as planned and has passed the site acceptance process. Installation of the Leningrad safety system has been delayed due to U.S. sanctions.

The Department and the U.S. Agency for International Development have been working over the past several years on a multinational effort to shut down the Chernobyl nuclear power plant in Ukraine to reduce further safety and environmental risks. In FY 1999, a comprehensive decommissioning engineering survey of Unit 1 was completed as planned.

Overall, we believe we were successful in achieving our FY 1999 goals for this objective.

Environmental Quality

FY 1999 Net Budget Authority by Business Line
(Dollars in Millions)
Total \$17,968



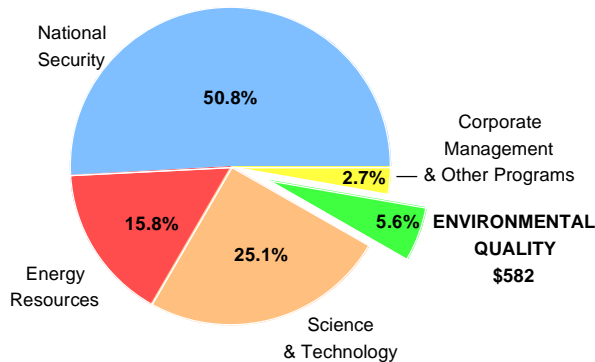
The Department of Energy is aggressively cleaning up the environmental legacy of nuclear weapons and civilian nuclear research and development programs, minimizing future waste generation, safely managing nuclear materials, and permanently disposing of the Nation's radioactive wastes

Perhaps the greatest challenge that has faced the Department in the 1990's is the monumental task of cleaning up contaminated sites and disposing of radioactive waste.

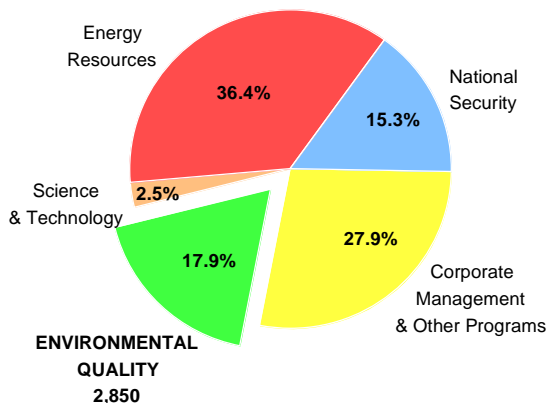
In our environmental quality business line, we are working to:

- Reduce the most serious risks from the environmental legacy of the U.S. nuclear weapons complex first.
- Clean up as many as possible of the Department's 53 remaining contaminated geographic sites by 2006.
- Safely and expeditiously dispose of waste generated by nuclear weapons and civilian nuclear research and development programs and make defense high-level radioactive wastes disposal-ready.
- Prevent future pollution.
- Dispose of high-level radioactive waste and spent nuclear fuel in accordance with the Nuclear Waste Policy Act as amended.
- Reduce the life-cycle costs of environmental cleanup.
- Maximize the beneficial reuse of land and effectively control risks from residual contamination.

FY 1999 Operational Net Costs by Business Line
(Dollars in Millions)
Total Business Line Net Costs \$10,431



FY 1999 Number of Federal Employees
(Full-time equivalents—FTEs)
Total Federal Employees 15,897



Objective 1: Reduce the most serious risks from the environmental legacy of the U.S. nuclear weapons complex first.

We have prioritized our cleanup actions to identify and complete the projects representing the most serious risks to workers, the public, and the environment first. Preventing further increases in risk to the environment at all sites is also a top priority.

Among our cleanup efforts, stabilizing and safely storing spent nuclear fuel was identified as a serious risk. The Department's target for the amount of heavy metal spent nuclear fuel to be stabilized and placed in interim storage was approximately 6 metric tons for FY 1999. However, we were only able to stabilize 0.34 metric tons, a significant reduction from our planned goal. This was due to operational difficulties encountered during the stabilization of the Three Mile Island spent nuclear fuel, which comprised the bulk of the planned FY 1999 stabilization activities. We have instituted plans for continuing stabilization activities with the Three Mile Island spent fuel and intend to restart those operations by February 2000.

Our project to stabilize and store plutonium waste is designed to eliminate the serious risk posed by U.S. inventories of this radioactive material. The plutonium waste we are dealing with is in a variety of forms: residue, solution, and metal/oxide. Our goal for FY 1999 was to stabilize 33,000 kilograms of residue, 40 liters of solution and 332 containers of metals and oxides. We were successful in stabilizing 31,000 kilograms of residue, 16 liters of solution and 275 containers of metal/oxides. These results are somewhat below our expectations and, for the most part, are due to technical issues we are working to resolve.

Cleaning our sites and protecting the environment is one of the Department's highest priorities. However, we did not meet the FY 1999 goals we established for our long-term objective to reduce the most serious risks first. These issues must be addressed more effectively in the future if we are to meet environmental compliance requirements.

Objective 2: Clean up as many as possible of the Department's 53 remaining contaminated geographic sites by 2006.

When the Department began its clean up effort, 113 sites were identified as needing remediation. At the end of FY 1997, when the accelerated cleanup plan was implemented, there were 53 remaining contaminated sites requiring cleanup. The Department met its goal by completing

Departmental Challenge: Environmental Compliance

The Department faces significant long-term environmental compliance and waste management problems at its facilities due to past operations that left a legacy of waste which was not stored or disposed of in accordance with current laws or standards. These circumstances dictate that continued high priority be given to evaluating and correct-

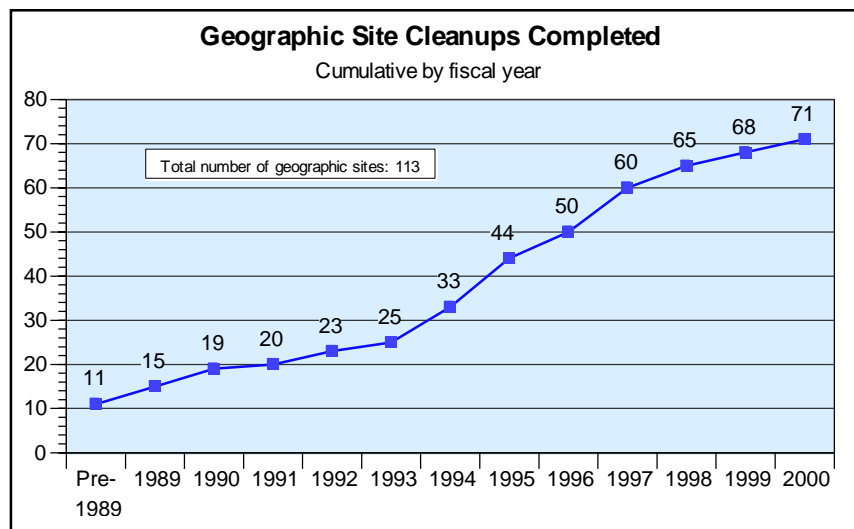
ing the impacts of past practices and characterizing and minimizing the possible adverse impacts of present and future activities. The Department is implementing an aggressive plan to accelerate the cleanup of its contaminated sites. The focus of the plan is to reduce the most serious risks and clean up as many sites as possible by 2006.

remediation of three sites in FY 1999. These sites and the five sites completed in FY 1998 bring the total number of completed geographic sites to 68, with 45 remaining to be cleaned up.

Progress is also demonstrated by cleaning up portions of the geographic sites referred to as “release sites” and “facilities.” Cleaning up these areas ultimately leads to the completion of

the entire geographic site cleanup. We completed 92 facility decommissionings, exceeding our goal of 80 and bringing the number of completed facility decommissioning to 540 out of a total inventory of 3,350 facilities. In addition, we nearly met our FY 1999 goal of 165 release site cleanups by completing 161 release site cleanups, bringing the total number of completed sites to 4,290 out of a total of 7,700 release sites.

We believe that our FY 1999 accomplishments support our objective of cleaning up as many sites as possible by 2006.



Objective 3: Safely and expeditiously dispose of waste generated by nuclear weapons and civilian nuclear research and development programs and make defense high-level radioactive wastes disposal-ready.

During 1999, waste disposal operations were initiated at the Waste Isolation Pilot Plant (WIPP), the Nation's first research and development facility to demonstrate the safe geological disposal of transuranic waste. The opening of the WIPP facility represents a significant achievement by the Department in its efforts to clean up the Nation's nuclear waste.



Truck delivering first waste to the Waste Isolation Pilot Plant.

Prior to FY 1999, the Department was not able to permanently dispose of the transuranic radioactive waste generated by its weapons complex. The schedule for opening the WIPP had experienced delays due to litigation. However, in 1998 the Environmental Protection Agency certified that WIPP complied with its radioactive disposal regulations and the Department informed Congress of its intent to begin disposal operations. On March 26, 1999, WIPP initiated waste disposal operations for transuranic waste. Thirty-two waste shipments from Los Alamos National Laboratory, Idaho National Engineering and Environmental Laboratory, and the Rocky Flats Environmental Technology Site were shipped to WIPP for disposal in FY 1999, exceeding our expectations.

Departmental Challenge: Permitting Issues at WIPP

In October 1999, the State of New Mexico issued the final permit for disposal of hazardous mixed transuranic waste. This permit places new restrictions on the Department's disposal of hazardous mixed transuranic waste and became effective in November 1999. The Department temporarily halted shipments to WIPP in

order to implement the provisions of the permit.

While the Department is legally challenging some of the provisions of the permit, we are currently restructuring the program in response to these new restrictions and expect waste shipments to resume in FY 2000.

In addition to opening WIPP, the Department made progress in other areas related to its commitment of safely and expeditiously making waste disposal-ready and disposing of waste generated during past and current DOE activities. In FY 1999, 248 canisters of existing high-level waste were made ready for disposal, exceeding our goal of 215 canisters. The Department also disposed of 49,400 cubic meters of low-level waste, which was significantly below our goal of 73,000 cubic meters. We did not meet our goal due to a lack of agreement on cleanup standards with the State of Nevada that is slowing our clean up efforts there. However, we nearly met our FY 1999 goal to dispose of 15,000 cubic meters of mixed low-level waste, by disposing of 14,300 cubic meters.

Our success in opening WIPP was a very significant accomplishment towards our long-term goal for waste disposal. While we are encountering difficulties in other areas, we believe our FY 1999 efforts were generally successful.

Objective 4: Prevent future pollution.

The Department of Energy's commitment to prevent future pollution is intended to ensure that we do not compound our future cleanup work from ongoing agency activities. In fact, pollution prevention, including waste minimization, recycling, and reuse of materials, was incorporated into all DOE activities. Our efforts to prevent pollution in FY 1999 resulted in the reduction of waste generation of over 32,000 cubic meters, exceeding our goals in this area.

We recognize that pollution prevention, recycling, and waste minimization are the key to meeting our future national objectives while preserving our natural resources. Our FY 1999 efforts were successful in this area.



Removing outer lid at the Waste Isolation Pilot Plant



Removal of tunnel boring machine at Yucca Mountain

Departmental Challenge: Nuclear Waste Disposal

In accordance with the Nuclear Waste Policy Act (NWPA), as amended, the Department has been conducting scientific studies of Yucca Mountain, Nevada, to determine its suitability for the development of a repository for the disposal of the Nation's spent nuclear fuel and high-level radioactive waste. Litigation, funding shortfalls, and the need for scientific studies well beyond the levels envisioned when the NWPA was initially passed in 1982, have necessitated several schedule changes, including the delay in the commencement of repository operations to 2010, as announced in 1989. Until a repository opens, high-level radioactive waste and spent nuclear fuel are being stored tempo-

rarily at numerous Departmental facilities and individual utilities sites around the country.

In 1998, a U.S. Court of Appeals ruled that the Department had an unconditional obligation to initiate waste acceptance by January 31, 1998. Because a Federal receipt facility constructed under the NWPA is not yet available, the Department is unable to initiate waste acceptance. As a result, several utilities and State regulatory agencies have brought suit against the Department. Damages may be awarded, depending upon the outcome of litigation; however, the source of funds for the claims is as yet undetermined

Objective 5: Dispose of high-level radioactive waste and spent nuclear fuel in accordance with the Nuclear Waste Policy Act as amended.

The Department has continued to make progress in its efforts to determine the suitability of the Yucca Mountain site for disposal of spent nuclear fuel and high-level radioactive waste. In July 1999, we completed and made available for public comment the draft Environmental Impact Statement for a repository at Yucca Mountain. Future milestones include: issuance of a final Environmental Impact Statement in 2001 and, if the site is determined to be suitable, submittal of a Site Recommendation

Report to the President in 2001; if the site is approved by both the President and the Congress, submittal of a License Application to the Nuclear Regulatory Commission in 2002; and commencement of operations in 2010.

We have met our FY 1999 goals for this objective.

Objective 6: Reduce the life-cycle costs of environmental cleanup.

Because the scope of the Department's cleanup effort is so large, we have taken steps to ensure that the costs are minimized through enhanced performance and increased efficiency. We have used many methods to control our costs, including the use of fixed-price competitive contracting, optimized project sequencing, privatization, systems engineering, and benchmarking.

During FY 1999 we continued the development and implementation of our strategy for privatizing some of our cleanup efforts. Our FY 1999 goal was to complete the design and begin construction on one project and award contracts for two others. We met our goal for the first project, but the schedule for awarding contracts on the other two projects slipped by a few months.

Innovative environmental cleanup, nuclear waste, and spent fuel technologies have contributed significantly to reducing our costs. In FY 1999, 125 innovative technologies were deployed across

the DOE complex, exceeding our goal. We also conducted 27 full scale demonstrations of alternative technology systems and made 40 available for implementation, meeting our goals in this area.

Another focus of our efforts to reduce costs is the deactivation of our surplus facilities and the placing of them in a safe and environmentally sound condition that requires minimal maintenance. During FY 1999 we completed 64 of the 65 surplus facility deactivations we had planned to accomplish.

We believe our efforts are on track to reducing the overall life-cycle cost of the Department's environmental cleanup and our FY 1999 results support our long-term objective.

Objective 7: Maximize the beneficial reuse of land and effectively control risks from residual contamination.

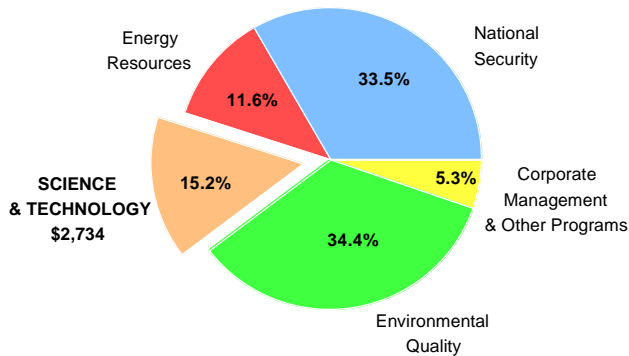
The Department is working very closely with stakeholders to ensure that remedies implemented remain protective of human health and the environment after cleanup projects are complete at DOE sites or portions of DOE sites. These post-cleanup activities, collectively referred to as long-term stewardship, will be required because the cleanup projects, while greatly reducing risks and annual costs, will impart a legacy of radiological, chemical, and physical hazards at DOE sites.

Meeting our FY 1999 goals, we published a background report on long-term stewardship that served as a companion piece to the *Accelerating Cleanup: Paths to Closure* document and began two major studies. The companion piece to the *Paths to Closure* document is serving as background information for a national study to examine long-term stewardship issues the Department is facing. Extensive public participation is planned for this study, and the Department will release a draft by June 2000. The second study will examine the residual hazards that will remain at sites or portions of sites that will complete cleanup by 2006. It will also examine the nature of activities that will be required to ensure continued protection of human health and the environment, and will provide an estimate of costs where possible. The Department has developed guidance, and data collection is underway.

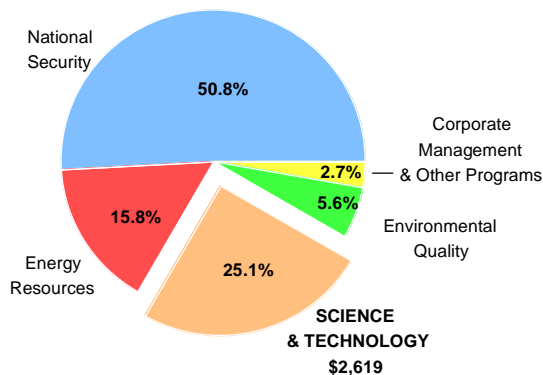
The FY 1999 goals for this objective were met.

Science and Technology

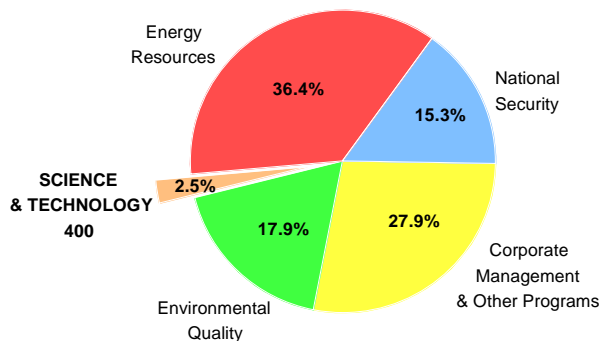
FY 1999 Net Budget Authority by Business Line
(Dollars in Millions)
Total \$17,968



FY 1999 Operational Net Costs by Business Line
(Dollars in Millions)
Total Business Line Net Costs \$10,431



FY 1999 Number of Federal Employees
(Full-time equivalents—FTEs)
Total Federal Employees 15,897



The Department of Energy is delivering the scientific understanding and technological innovations that are critical to the success of our mission and the Nation's science base

In our Science and Technology business line, we are working to:

- Develop the science that underlies DOE's long-term mission.
- Deliver leading-edge technologies that are critical to the DOE mission and the Nation.
- Improve the management of DOE's research enterprise to enhance the delivery of leading-edge science and technology at reduced costs.
- Assist in the Government-wide effort to advance the Nation's science education and literacy.

The 20th century has brought many scientific advancements that have resulted in dramatic changes in the products of commerce and communications technologies, and in the diagnosis and treatment of disease. We are learning to control matter at the atomic level, develop cleaner energy sources, and look deeply into the cosmos to the origins of matter and energy. Business can now be conducted worldwide with a few strokes of a keyboard as a direct result of communications protocols developed by the computing sciences and high energy physics communities, research in which the Department of Energy has played a key role.

Much of this country's economic growth, quality of life, and security derives from national investments and leadership in science and technology. The Nation's standard of living and prosperous technology-based economy are linked to our ability to invest public resources to secure benefits not attainable by the normal workings of the marketplace.



By developing the technologies needed to map and sequence the genetic script for an "average" human being, the benefits to be reaped stretch the imagination. In the offing would be a new era of molecular medicine characterized not by treating symptoms, but rather by looking to the deepest causes of disease. Even more promising, insights into genetic susceptibilities to disease and environmental insults could thwart some diseases altogether. It is estimated that defective genes directly account for 4,000 hereditary human diseases, maladies such as Huntington disease and cystic fibrosis, and it could become possible, in some cases, to actually "fix" genetic errors.

Objective 1: Develop the science that underlies the Department's long-term mission.

Conducting relevant, high-quality research is critical to developing the science that responds to the Department's mission. One of our efforts is to participate in a coordinated international effort to determine the complete human DNA sequence. The ultimate goal is to discover all of the more than 80,000 human genes and render them accessible for further biological study. During the first months of FY 1999, the DNA sequencing goals of this international effort underwent significant discussion and change. As a result, the international community agreed to complete a high-quality draft of the human genome in the spring of 2000 and to determine the complete sequence of the human genome by 2003, both goals several years ahead of the original schedule.

During FY 1999, DOE produced 15.2 million subunits of human DNA sequenced to accepted international quality standards, less than our original goal of 30 million subunits. However, in accordance with the new goals of the international project, the DOE produced 55 million subunits of high-quality draft and 70 million of Phase I draft sequences, greatly exceeding our second FY 1999 goal of 30 million additional subunits of draft human DNA sequence. The level of DNA sequence produced by DOE between October 1, 1998, and September 30, 1999, actually reflects an increase in sequencing output over DOE's original goals for FY 1999 and is consistent with the current goals of the international human genome project.

We are also working to develop the science that supports DOE's participation in energy policy and other national policy formulations. To this end, we are

actively pursuing the identification of microbes with potential use in waste cleanup or energy production. Our goal in FY 1999 was to determine 70 percent of the DNA sequence of 10 microbes that met that criteria. We exceeded that goal by completing 100 percent of the DNA sequences of five microbes, determining more than 95 percent of the DNA sequences of seven additional microbes, and more than 70 percent of the DNA sequence of one additional microbe with potential use in waste cleanup or energy production. Among these organisms is a remarkable radiation resistant microbe, which is a potential workhorse for helping cleanup DOE waste sites, and an organism that can consume toxic organic pollutants and convert toxic metals and radionuclides to less toxic forms.

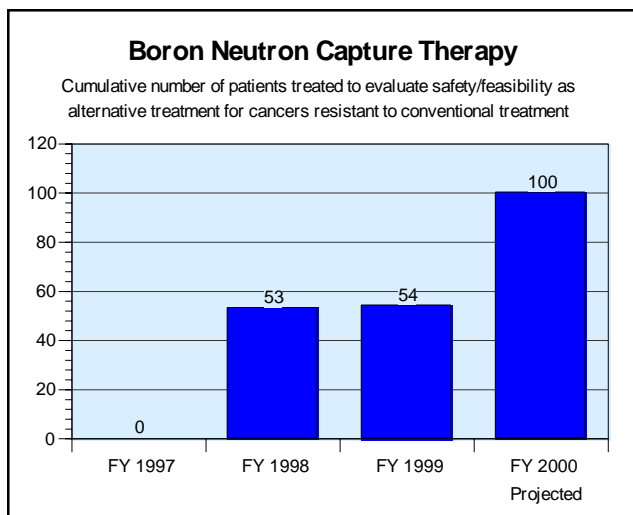
As part of our efforts to develop science underlying our long-term mission, we are providing new insights into the fundamental nature of energy and matter. In FY 1999, a newly constructed research facility at the Stanford Linear



The Stanford Linear Accelerator Center is a national basic research laboratory, probing elementary particle physics and developing new technology in high energy accelerators and elementary particle detectors. Photo depicts a cross-section of the large detector where electrons and positrons collide.

Accelerator Center began operations as planned. This facility is being used to collide ultra-high-intensity beams of electrons and positrons. The results of the collisions will be studied to help us understand why the universe now consists only of matter, when initially matter and antimatter existed in equal proportions. In addition, the Main Injector at Fermilab, which will increase the intensity of the Tevatron, the world's highest energy proton-antiproton collider, was completed and commissioned as planned. The resulting five-to tenfold increase in intensity will be a great help in our efforts to understand the origin of the masses of elementary particles. Meeting another FY 1999 goal, the Relativistic Heavy Ion Collider, which will collide gold atoms with each other at very high energies, was completed and commissioned at Brookhaven National Laboratory. It will search for the quark-gluon plasma, a state of matter which has not existed in the universe since the first few microseconds of the Big Bang.

By supporting new emerging sciences that are important to the future of DOE and the Nation, we are proactively addressing some of the Nation's most pressing problems. Boron Neutron Capture Therapy represents an experimental approach to cancer treatment which is based on a dual-step technique. First a boron-containing compound is intravenously injected into the patient. This boron accumulates at higher concentrations in the tumor than in nearby normal tissues. Next a beam of low-energy neutrons is directed at the boron-containing tumor. The charged particles release sufficient energy locally to kill any tumor cells containing high concentrations of boron without appreciably harming cells that contain low concentrations of boron. In 1999, we treated 20 patients, which is lower than our goal of 25 to 30 patients. Of these, one patient was new, bringing the cumulative number of patients treated to 54.



Another emerging science we are pursuing is the discovery of new biological structures. As planned, during FY 1999 more than 60 percent of the new high-resolution, three-dimensional structures published in peer reviewed journals were determined at DOE facilities. Among the many protein structures determined was the ribosome, the protein-synthesizing machinery in cells. It is the largest protein structure determined to date.

Our successes in FY 1999 demonstrate our long-term commitment to the development of science that contributes to the Department's mission. We are pleased with the results.

Objective 2: Deliver leading-edge technologies that are critical to the Department's mission and the Nation.

Through developing technologies, DOE is striving to provide leadership and the means to promote achievement in the areas of national security, environment, and energy.

The Department supplies quality stable and radioactive isotopes for industrial, research, and medical applications. During FY 1999, our isotope programs supplied nearly 1,126 shipments to domestic and overseas customers. This was accomplished with an on-time delivery record of more than 95 percent, exceeding our goal of 95 percent. In addition, we initiated construction activities at the Isotope Production Facility during the year as scheduled. This project, which was subjected to an independent design review that identified only minor issues and cited several noteworthy good practices, will improve isotope quality with greater efficiency.

We are also seeking to accelerate the transition of leading-edge technologies to end users. In support of this, during FY 1999 we provided fundamental research that will underpin the cleanup of contaminated sites. As planned, sampling of both groundwater and sediment was conducted at two of the Department's remediation sites. The results of these samples will be to determine whether biotransformation of uranium and other contaminants is



One of every three people treated at a hospital is estimated to benefit from the use of at least one radioisotope during diagnostic procedures (shown here), therapy, or laboratory testing.



An ultra-pure form of medical isotope yttrium-90 is being extracted from nuclear weapon production waste and being used to treat a variety of cancers. Radioisotope-tagged monoclonal antibodies act as "Smart Bullets" by targeting malignant cancer cells for diagnosis and treatment.

occurring under field conditions. We have also established a collaborative research program within DOE to develop promising cleanup technologies. However, though progress is being made, this program is behind schedule due to a lack of funding.

Overall, we believe our FY 1999 accomplishments have successfully achieved the intended results.

Objective 3: Improve the management of DOE's research enterprise to enhance the delivery of leading-edge science and technology at reduced costs.

The Department is committed to managing its national laboratories, science-user facilities, and other research facilities in a more integrated, responsive, and cost-effective way. To this end, we are interested in ensuring new research facilities are constructed on time and within budget. Our activities during FY 1999 to design and initiate construction of the Spallation Neutron Source are on schedule. When complete, the Spallation Neutron Source will be an accelerator-based neutron source designed to meet needs within the scientific and industrial communities in the U.S. well into the next century. Early neutron sources built in the U.S. and abroad rapidly demonstrated the utility of neutrons for research in understanding and developing new materials. The Spallation Neutron Source will provide next-generation capabilities in this area.

The Department has also been devising new ways to use, disseminate, and share scientific and technical information to a growing community. In FY 1999, all major DOE laboratories, contractor sites, and field locations (more than 40 unique sites) have been connected to an on-line means of electronically capturing DOE-sponsored scientific and technical information. Ahead of schedule, the DOE Energy Link system was developed and implemented to provide a more effective complex-wide means of announcing and making full-text information electronically accessible. Similarly, researchers and the public can access Departmental scientific and technical information through a newly implemented electronic infrastructure. The information on the system was accessed more than 1.5 million times during FY 1999, far exceeding our expectations.

Another action we are taking toward improving the management of our research enterprise is to improve our peer and program review processes. Our goal during FY 1999 was to receive an assessment from the National Academy

Spallation Neutron Source

What is Spallation?

Spallation is an action that occurs when individual protons collide with a heavy atom nucleus. As a result of this collision, some neutrons are "boiled off" in a nuclear reaction process called spallation. These neutrons are then guided into an area where they are used for various experimental research and development projects.

Why are we building the Spallation Neutron Source?

Just as it is possible to see much finer detail under a bright light, so finer detail can be "seen" inside experimental materials using a more intense neutron source. The Spallation Neutron Source will produce the highest intensity pulsed neutron beams in the world.

of Sciences on the quality of the science produced by the Department's Fusion Energy Sciences program. Although an interim report with initial comments has been issued, the final report with a more comprehensive assessment will not be issued until FY 2000.

Although our efforts to improve our peer review process are somewhat behind schedule, we were very successful in our other FY 1999 efforts to improve management of our research enterprise. Overall, we are pleased with the results of our FY 1999 efforts.

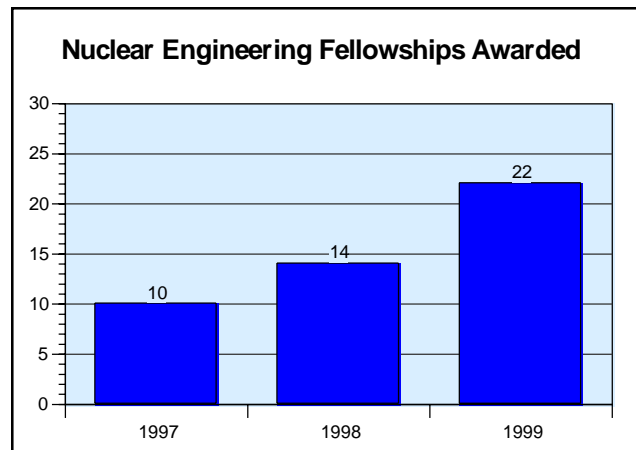
Objective 4: Assist in the Government-wide effort to advance the Nation's scientific literacy.

Continued success nationally depends on developing and promoting programs that deliver information and contribute to learning in science, math, engineering, and technology.

The Department conducts the University Reactor Fuel Assistance and Support program that provides funding for U.S. university nuclear engineering programs and university research reactors. In an effort to attract outstanding U.S. students, we offer fellowships in the field of nuclear engineering. As planned during FY 1999, the number of fellowships available increased by 8 to 22 and the number of Nuclear Engineering Education Grants available more than doubled to 39. This endeavor will help maintain our nuclear engineering manpower infrastructure into the next century. We also contributed to improved nuclear energy research and educational opportunities by assisting U.S. universities with their research reactors. As planned, during FY 1999 all U.S. universities that requested fresh nuclear fuel received it to continue to operate their reactors. In addition, 21 universities received funding to upgrade the performance of their reactors.

Further, in FY 1999 we initiated two new programs as planned: the Summer Undergraduate Research Experience program with 16 awards and the Graduate Research Environmental Fellowships program with 10 awards. Students spent the summer on assignment at various DOE laboratory facilities and presented research results from their efforts.

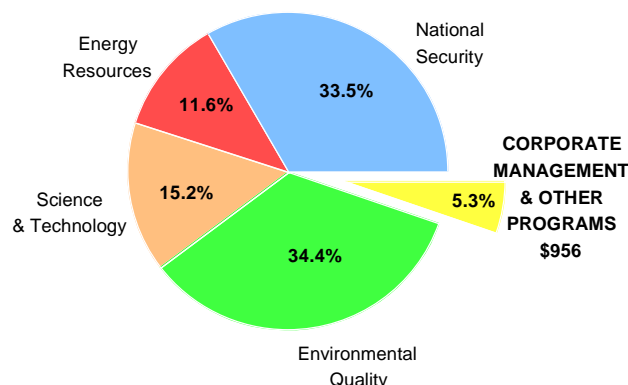
We are pleased with our successes in advancing the Nation's science and literacy during FY 1999.



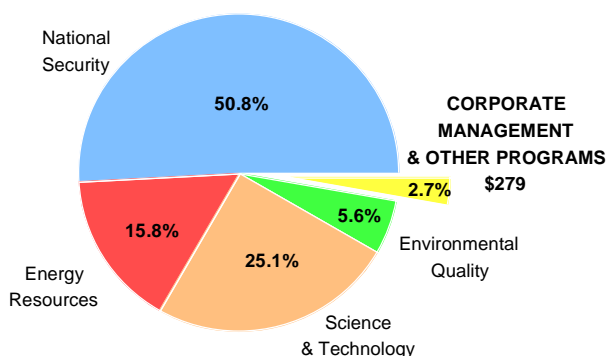
College students take advantage of research opportunities as part of the Department's Energy Research Undergraduate Laboratory Fellowship Program sponsored by the Department's Office of Science.

Corporate Management

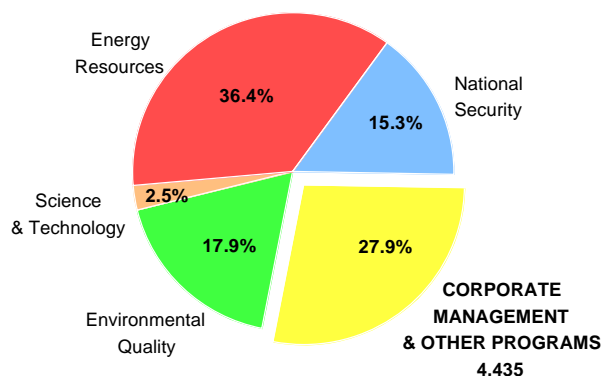
FY 1999 Net Budget Authority by Business Line
(Dollars in Millions)
Total \$17,968



FY 1999 Operational Net Costs by Business Line
(Dollars in Millions)
Total Business Line Net Costs \$10,431



FY 1999 Number of Federal Employees
(Full-time equivalents—FTEs)
Total Federal Employees 15,897



The Department of Energy strives to demonstrate organizational excellence in its environment, safety, and health practices; in its communication and trust efforts; and in its corporate management systems and approaches

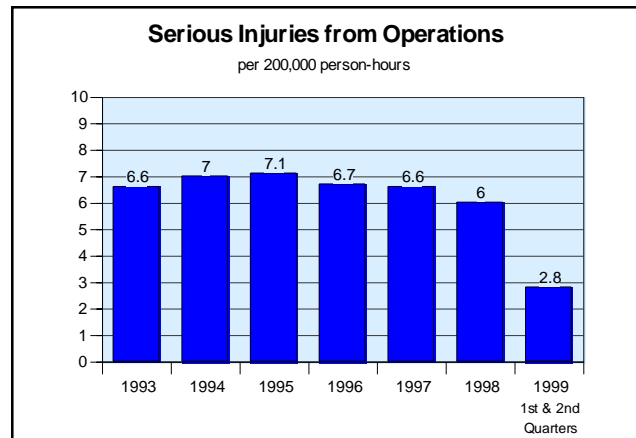
The Department's success within its diverse portfolio of programs is largely dependent upon a strong and sound corporate management function. This function includes not only the typical administrative, staff, and operational functions associated with an organization, but also encompasses essential crosscutting activities related to the environment and the safety and health of our workers and the public; effective communication and trust with our stakeholders; and highly efficient managerial practices.

In our corporate management function, we are working to:

- Ensure the safety and health of the DOE workforce and members of the public and the protection of the environment in all Departmental activities.
- As a good neighbor and public partner, continually work with customers and stakeholders in an open, frank, and constructive manner.
- Use efficient and effective corporate management systems and approaches to guide decisionmaking, streamline and improve operations, align resources, and reduce costs.
- Improve the delivery of products and services through contract reform and the use of business-like practices.
- Implement information systems so employees can perform their jobs efficiently and effectively.
- Improve performance through evaluations, reviews, audits, and inspections.

Objective 1: Ensure the safety and health of the DOE workforce and members of the public and the protection of the environment in all Departmental activities.

The Department's top priority is to prevent fatalities, serious accidents, and environmental releases at its sites. During FY 1999, our goals were exceeded, as the Department had no work-related fatalities, and worker safety and health have continued to improve as serious accidents and environmental releases have been on a downward trend over the past 3 years.



Departmental Challenge: Safety and Health

Despite our success in preventing fatalities and serious accidents, there are ongoing safety issues at many of our facilities.

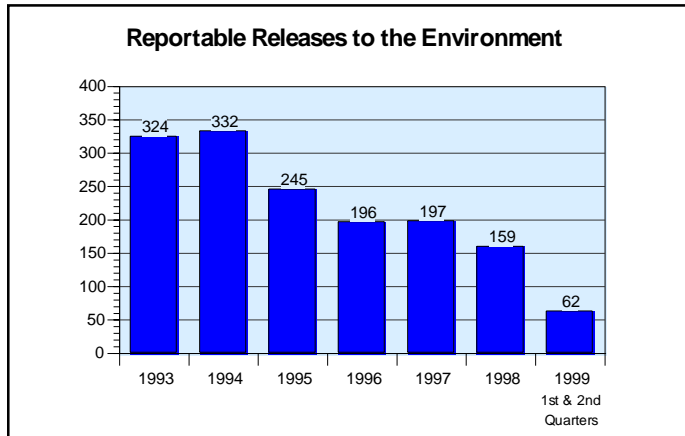
The Department of Energy is tasked with simultaneously addressing the consequences of past activities, managing current operations, and preventing future human and environmental problems. We are attempting to meet these challenges through implementing a variety of initiatives, including Integrated Safety Management. The Department has demonstrated its commitment to the principles of Integrated Safety Management and has evidenced this commitment by establishing safety and health programs that protect its workers, the public, and the environment. The challenge remains that improvements in worker safety are being offset by adverse trends in safety records related to construction and

industrial service. Also, while the principles of work planning and hazard analysis have been established at some sites, at many others these principles are limited in their implementation, especially where subcontractor personnel are involved. A need to improve accountability for safety management performance is apparent in the Department's self-assessment and corrective action processes and in the under-utilization of "lessons learned" information. Recent events at our facility located at Paducah, Kentucky, and the Y-12 plant in Oak Ridge, Tennessee, highlight the continued importance of implementing a comprehensive safety and health strategy across the complex.

Through 1999, the Department has added requirements for developing and reviewing Integrated Safety Management system descriptions into all major management and operating contracts; established a Safety Council which will help

monitor the implementation of Integrated Safety Management; and continued positive trends in ensuring worker safety and health and limiting environmental releases. Additionally, we completed 13 safety management evaluations in FY 1999 which support our ability to monitor the implementation of current safety standards and provide feedback critical in completing the nuclear safety standards upgrade project. Further, through 1999, 65 of the 106 vulnerabilities identified with our storage of spent nuclear fuel had been corrected.

The Department's plan to correct these problems includes the publication of remaining Nuclear Safety Management Rules; inserting a clause into contracts that puts the contractor's entire performance-based fee at risk for unacceptable safety performance, and completing actions to correct deficiencies.



Meeting the challenge of maintaining adequate worker and public protection in an environment with aging facilities, resource constraints, and uncertain future requirements is a great challenge. Despite these hurdles, the Department remains committed to protecting the interests of its workers and the public through stronger safety and health oversight and by identifying and responding quickly to safety and health issues that arise. Although we were successful in achieving our specific FY 1999 goals, we have much left to achieve in our long-term objective.

Objective 2: As a good neighbor and public partner, continually work with customers and stakeholders in an open, frank, and constructive manner.

Since the end of the Cold War, the Department has undergone a transformation from a secretive, weapons-producing agency to a results-driven, customer-focused leader in science, technology, and environmental management. This has been accomplished by emphasizing openness, enhancing communications, and fostering trust among stakeholders. During FY 1999, the Department met its goals by conducting approximately 150 stakeholder meetings to increase public involvement in crosscutting environmental quality issues. These stakeholder meetings consisted of participants from advisory boards from across the DOE complex, State and local governments, Native American tribes, and interested individuals. To further foster strong partnerships with neighboring communities, the Department also met its 1999 commitment to conduct "Communicating with the Public" training sessions for DOE managers by holding seven training sessions at various DOE sites across the country.

We are also working to increase openness by declassifying information about the Department's activities while maintaining a balance with the Nation's security. During FY 1999, we declassified more than 2 million pages of documents, meeting our goal of releasing information that no longer needs to be withheld for security reasons.

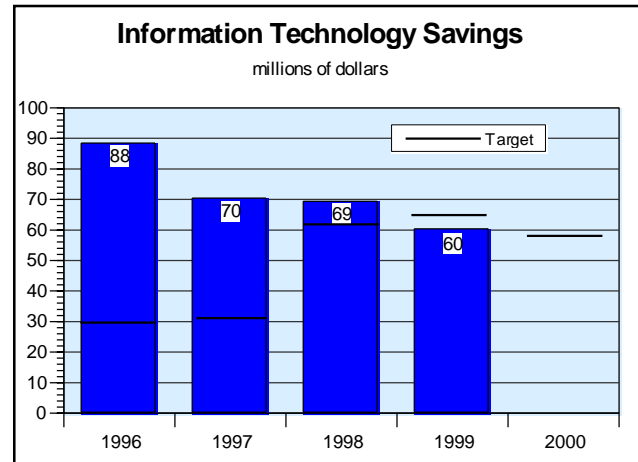
Another thrust of the actions we are taking to be a good neighbor and public partner is to develop a public health agenda for DOE sites. The primary challenge to the Department in the area of worker and public health has been the lack of a consistent, complex-wide approach to performing health studies. To address this, we are working closely with the Department of Health and Human Services to prepare a consolidated and coherent strategy for worker and public health effects studies and activities. Stakeholder input is key to this initiative. During FY 1999, we issued a draft public health agenda and received public comments. However, the receipt and incorporation of public comments has taken longer than expected. As a result, we did not meet our goal of issuing a final public health agenda for each site during the year. We expect this to be complete in FY 2000.

While we have been successful in some areas, not all of the FY 1999 goals we established to be a good neighbor and public partner were met.

Objective 3: Use efficient and effective corporate management systems and approaches to guide decisionmaking, streamline and improve operations, align resources, and reduce costs.

As the Department's missions and business environment have changed, so has our need for business systems. Recognizing this, the Department has embarked on a project to develop a new Business Management Information System, with a special emphasis on financial management. During FY 1999, we worked on identifying functional and technical system requirements for the financial management component of the system. Though we nearly accomplished our goal of completing those requirements, they will not be done until FY 2000. However, this will not impact major milestones for the project.

Another thrust of our efforts is to streamline and improve our operations. In FY 1999, the Department met its goal and continued to accumulate savings from such actions. Staffing is being reduced. The end-of-year staffing, excluding the power marketing administrations, was 10,275, below our targeted goal of 10,613. Savings from information technology were \$60 million in FY 1999, short of our \$65 million goal; but our FY 2000 goal of \$245 million in cumulative savings has already been exceeded. Support services contracts obligations were significantly reduced to \$428 million, exceeding our goal of \$610 million.



Departmental Challenge: Mission Critical Staffing

Although FY 1999 appeared to be a turning point, allowing for more hiring and flexibility in training and retaining our existing work force, FY 2000 budgets are again requiring the Department to restructure and reshape to meet new and/or changing missions and to operate within available funding. The Office of Nonproliferation and National Security cannot perform critical functions within the current staffing allocations. Critical functions affected include support for the federal oversight of

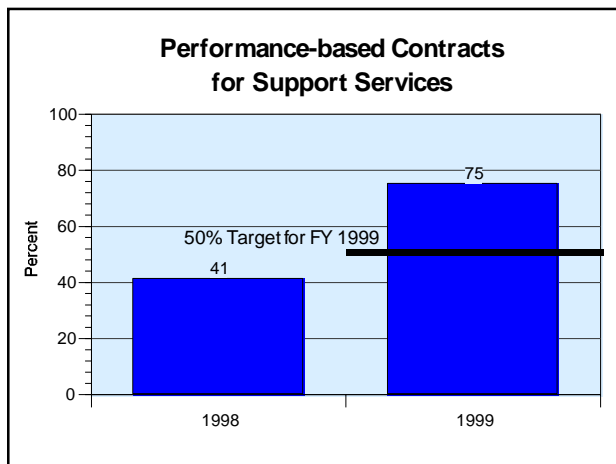
programs within the former Soviet Union; the U.S. Nuclear Detonation Detection System; projects relating to security of weapons-usable fissile material; the Nuclear Nonproliferation Treaty; and responsibilities in the Atomic Energy Act, Nuclear Nonproliferation Act, and Export Administration Act. Office of Security and Emergency Operations requests for mission critical staffing have not been funded, adversely affecting our ability to detect or respond to terrorist use of chemical or biological weapons, maintain technical viability of the Nuclear Materials Management and Safeguards System,

and monitor visits by foreign nationals to Department facilities. Current Office of Chief Financial Officer staffing does not fully support mission functions such as oversight of the financial operations at the Department's major contractors, financial analysis, and accounting operations. This challenge in our financial area will be intensified by additional workload resulting from new Federal accounting standards, creation of the National Nuclear Security Agency, and implementation of several new Departmental financial systems.

Improving our human resource utilization is another focus of our efforts in this area. In FY 1999, we were successful in completing our planned actions to improve workforce skills, reduce training costs, and implement an employee accessible automated personnel system. However, aligning our resources to meet the Department's needs remains an issue we are working to address.

We believe the Department is making strides towards operating efficient and effective corporate management systems that maximize Departmental resources and results. While we were successful in achieving some of our FY 1999 goals, we were not successful in achieving others.

Objective 4: Improve the delivery of products and services through contract reform and the use of business-like management practices.



The use of prudent contracting and business management approaches is critical to the success of our operations. Recognizing this, the Department has implemented a new contracting approach that emphasizes contractor performance and accountability. Our new contracting approach is evidenced by our FY 1999 actions. All management and operating contracts awarded during the year were performance based, as planned. Seventy-five percent of the support service contracts awarded during the year were performance-based. We also awarded 60 percent of all management and operating contracts as competitive contracts, exceeding our goal of 50 percent. Additionally, as planned, a new DOE contractor fee policy was developed and published.

Departmental Challenge: Contract Management

The Department has reformed its contracting practices, which were largely unchanged for more than 50 years. The weaknesses in our contracting practices were substantial and required major improvements to increase competition, incentivize contractor performance, and hold contractors more accountable for their performance. To correct these problems, we instituted an extensive, multi-year

contract reform initiative. This effort includes aggressively recompeting contracts, tying performance metrics to contractor fees to incentivize improved performance, and shifting risk to contractors in exchange for the opportunity to earn higher fee amounts. While this reform effort is applicable to all our contracts, it is especially pertinent to the large contracts we have with companies managing and operating our major

facilities, to which we fund more than \$13 billion per year. Although the Department has recompeted and incentivized many contracts, we are due to recompete seven major contracts this year. We are continually evaluating our contract reform efforts to achieve the proper risk-reward balance and to improve the use of performance incentives in our contracts.

To emphasize results and accountability in our business management approaches, the Department produced its first Accountability Report, for FY 1998, merging legislatively required reports on performance and management controls, audited financial statements, and other information. DOE successfully delivered the Accountability Report to OMB on March 1, 1999; however, we did not meet our goal of obtaining an unqualified audit opinion due to issues surrounding the estimate of DOE's future environmental liabilities. We aggressively pursued the correction of that problem during the rest of FY 1999.

Another focus of our efforts is the application of business-like practices to the management of our large projects. Although we are making progress in this area and have established a strong corporate capability for providing oversight and supporting the Department's project managers, this is an area we continue to need to address.

Although we believe we are making progress in our contract reform activities, overall we have not been successful in achieving our goals related to our use of businesslike management practices.

Departmental Challenge: Project Management

The use of business-like practices extends to the management of DOE's projects and assets. However, credibility in the Department's ability to build new facilities or upgrade existing systems has been adversely affected by reports of cost overruns, schedule slippages, and other project management problems. These issues have led to Congressional concerns about the Department's construction project management structure and practices.

To correct this problem, Departmentwide policy and procedures have been assessed by an expert panel formed under the National Research Council of the National Academy of Sciences, which con-

cluded that the Department's prior efforts to address project management issues were not successful and that further improvements are needed. In accordance with Congressional direction, services were procured during FY 1999 for independent evaluation of the Department's construction planning and management practices. Both external and internal on-site reviews were also conducted to evaluate the effectiveness of project management system improvements. Late in FY 1999, responsibility for corporate oversight of the Department's project management functions was assigned to the Office of the Chief Financial Officer and a new organizational structure was initiated. Recommendations from the National Research Council, as well

as those gleaned from internal reviews, are being addressed and implemented through a comprehensive plan. The Department is also strengthening line management accountability for project management by establishing and monitoring the Chief Operating Officer's "Project Management Watch List," which subjects specific projects to stringent monthly reviews and reporting requirements. As a result of continued problems, the final correction of these issues has been extended until FY 2002 to include additional project reviews and benchmarking efforts to further identify needed improvements to our project management practices.

Objective 5: Implement information systems so employees can perform their jobs efficiently and effectively.

To be effective, our information systems must meet the needs of our workforce. To this end, we are working to improve our information infrastructure to allow staff the capability of accessing and sharing information easily and seamlessly across the DOE complex. As a result, during FY 1999 we improved the reliability of our network infrastructure through implementation of redundant and enhanced communication links as planned. In addition, we improved our electronic mail infrastructure to help sustain continuous information delivery.

The Department's information systems must not only meet workforce needs, but must also be based on cost-effective technology. To ensure this, we have been working to continuously evolve the Department-wide information architecture to foster \$100 million of cost avoidances by FY 2003. Actions taken during FY 1999 are a part of this longer-range effort and are creating cost avoidances through work process improvements and the elimination of satellite or duplicative systems. The results of our FY 1999 efforts exceeded our expectations and assure we are well on our way to meeting our overall target of \$100 million in FY 2003.

We believe our FY 1999 actions were successful in meeting our objective to have systems that allow employees to perform their jobs efficiently and effectively.

Objective 6: Improve performance through evaluations, reviews, audits, and inspections.

DOE's Office of the Inspector General plays an important part in the Department by promoting effective, efficient, and economical operations through audits, investigations, inspections, and other reviews.

Departmental Challenge: Inadequate Audit Coverage

There are deficiencies in the audit coverage of our major contractors, who perform many of the functions integral to the Department's mission. As a result, the Department lacks full assurance that its contractors are being reimbursed only for costs that are reasonable and allowable. The Cooperative Audit Strategy, which was intended to maximize audit coverage by utilizing both Office of Inspector General and

contractor internal audit staff, has been hindered by rapidly increasing statutory audit requirements and contractor internal audit staffing levels that have decreased over the past several years. So while the Office of Inspector General has developed a long-range plan to audit every significant function of each contractor's operation on a cyclical basis, audit staffing and resource limitations have made this plan unachievable.

With the Office of Inspector General using an audit strategy based on an assessment of the greatest risks and benefits to key Department programs, this risk-based approach can only mitigate, not eliminate, the effect of inadequate staffing. The Office of Inspector General is working to resolve staffing issues in order to accomplish an acceptable level of audits of our major contractors.

In FY 1999, the Office of the Inspector General met its goal to conduct reviews based on assessment of risk and/or benefit to key DOE programs. In conducting these reviews, the Inspector General considers at least 23 locations, which account for \$13 billion in annual obligations, to be high risk. In addition, the Inspector General goals to focus investigations on allegations of serious violations of Federal law and to render an opinion of the

Department's financial statements was met. Also, the Office of the Inspector General met its FY 1999 goal and successfully completed 66 percent of the audits planned for the year and replaced those not started with more significant audits that identified time-sensitive issues needing review.

Status of Year 2000 Actions

The Department's efforts to ready our computer systems for Year 2000 were successful. Out of our universe of more than 200,000 systems, only 36 incidents were reported. Sixteen of these incidents involved minor problems to mission-critical systems. The impact of these incidents was mitigated using contingency plans, and all systems were corrected as of January 11, 2000. No operational impacts occurred as a result of these incidents.

Our successful transition can be attributed to the thoroughness of our risk assessment and the resultant contingency plans put in place to deal with any problems that arose during the transition to Year 2000.

Our risk assessment indicated that site systems supporting critical functions have several backup systems or alternate means of accomplishing the required functions. The systems in the operating facilities have normal, abnormal, or alarm response and emergency implementing procedures in place that were tested through the facility operating and drill programs. This is an in-depth methodology that addresses step-by-step actions required to deal with any failure, to include safe shutdown if required. Many systems also have disaster recovery plans in place as a normal course of business. The business continuity plan and contingency plans in place added further depth to this already existing, detailed, procedural emergency operations plan. Our analysis of worst-case scenarios, which addressed all risks associated with the Department's nuclear facilities and waste storage facilities, were thoroughly analyzed, and contingency plans were put in place to mitigate associated risks of a Year 2000 related system failure. Extensive on-site analysis of the Year 2000 century date change revealed no foreseeable negative impacts to mission-critical systems.

During the actual transition, the Chief Information Officer coordinated coverage within the Headquarters Emergency Operations Center. The Lead Program Secretarial Offices, the Office of Policy, Public Affairs, Intelligence, and the Energy Information Administration participated. In addition, key staff from the electricity, natural gas and oil industries worked with us in the Emergency Operations Center. Activities included monitoring incoming reports from all Departmental sites, analyzing the data, and preparing and forwarding reports to the White House Information Coordination Center. A status was provided every two hours throughout this period.

The Secretary of Energy was present through the rollover. Constant communication was maintained with the Russian Ministry of Atomic Energy.

To ensure continued success of our transition, the Department will continue to monitor our systems for potential Year 2000 problems through the leap year date of February 29.

Year 2000 Remediation Costs and Future Estimates
(millions of dollars)

1996	1997	1998	1999	2000	Total
\$1.0	\$19.9	\$83.9	\$110.0	\$19.9	\$236

Management's Response to Inspector General Audit Reports

The Department responds to audit reports by evaluating the recommendations they contain, formally responding to the Inspector General (IG), and implementing agreed upon corrective actions. In some instances, we are able to take corrective actions immediately and in others, action plans with long-term milestones are implemented. This audit resolution and follow-up process is an integral part of our efforts to deliver our priorities more effectively and at the least cost. Actions taken on audit recommendations increase both the efficiency and effectiveness of our operations and strengthen our standards of accountability. The Inspector General Act, as amended, requires that we report on the status of our progress in implementing these corrective actions semiannually. We are fulfilling that requirement by providing information for the entire fiscal year in this section.

At the end of FY 1999, the Department had 41 IG reports with agreed upon actions that were open after one year and had taken final action on 41 IG operational, financial, and preaward audit reports. At the end of the period, 95 reports awaited final action. Some of these reports contain recommendations to make changes to our operations in order to save funds that could be reapplied elsewhere in the future. The table below provides more detail on the audit reports with open actions and the dollar value of recommendations that funds "be put to better use" that were agreed to by management.

Status of Final Action on IG Audit Reports for FY 1999

Audit Reports	Number of Reports	Agreed-Upon Funds Put to Better Use
Pending final action at the beginning of the period	72	\$129,605,294
With actions agreed upon during the period	64	\$5,907,250
Total pending final action	136	\$135,512,544
Achieving final action during the period	41	\$13,117,733
Requiring final action at the end of the period	95	\$122,394,811

Also during this period, management made decisions on four Inspector General contract audit reports, disallowing \$1,524,891 in questioned costs. Final action was taken on three reports, netting \$656,439 in recoveries. At the end of the fiscal year, there were three contract audit reports pending final action.

General Accounting Office Audit Reports

The U.S. General Accounting Office (GAO) audits are a major component of the Department's audit follow-up program. During FY 1999, we received 59 audit start notifications and were issued 40 draft and 46 final GAO audit reports. Of the 46 final reports, 31 required tracking of corrective actions and 15 did not because the reports did not include actions to be taken by the Department. In addition, we completed agreed upon corrective actions on 13 audit reports. At the end of FY 1999, there were six GAO reports with agreed upon actions open after one year.

Summary of Departmental Challenges

Departmental challenges are identified in this report in accordance with the Federal Managers' Financial Integrity Act (FMFIA). The objective of the FMFIA is to identify areas of vulnerability in the operations of the Government and ensure that appropriate attention is given to mitigating problems that may affect the judicious expenditure of the taxpayers' money. As required by the FMFIA, the Department has evaluated its management controls to provide reasonable assurance that they were working effectively, that program and administrative functions were performed in an economical and efficient manner consistent with applicable laws, and that assets were safeguarded against the potential for waste, fraud, abuse, or mismanagement. The results of the evaluations indicate our system of management controls provides reasonable assurance that those objectives were achieved except for the problems identified as Departmental challenges in this report.

Current Departmental Challenges	Scheduled Correction
Surplus Fissile Materials	2005
Environmental Compliance	2006
Nuclear Waste Disposal	2010
Safety and Health	2005
Project Management	2002
Security	2001
Mission Critical Staffing	2001
Permitting Issues at Waste Isolation Pilot Plant	2000
Contract Management	2000
Inadequate Audit Coverage	TBD

Issues Emerging as Potential Problems

None new in FY 1999

Status of FY 1998 Emerging Issues

Declining Oil Import Protection	Closed
Counterintelligence	Merged with Security*
Workforce Planning	Closed

Statistical Status of Departmental Challenges

Beginning of FY 1999	10
New	2
Closed	0
Merged	(1)
Reported as Financial System Nonconformance	(1)
End of FY 1999*	10

*In FY 1999, one previous Departmental challenge (Unclassified Computer Security) and an emerging issue (Counterintelligence) were incorporated into a new Departmental Challenge (Security). Financial Management System Improvements, previously reported as a Departmental challenge, is now reported as an accounting system nonconformance in the Financial Overview.

Message From the Chief Financial Officer



I am pleased to present the Department of Energy's consolidated financial statements for FY 1999. These statements were prepared in accordance with standards developed by the Federal Accounting Standards Advisory Board, requirements of the Office of Management and Budget, the Chief Financial Officers Act of 1990, and the Government Management Reform Act of 1994. These statements have been audited by the Inspector General, and I am pleased to report that the Department received an unqualified opinion attesting to their accuracy.

The Department also has conducted an evaluation of its financial management system using guidance issued by the Office of Management and Budget. This evaluation indicated that the Department's financial management system is in general conformance with governmental financial system requirements. However, two areas need further improvement. First, the Department's financial management system needs to be upgraded to produce financial information faster and in an easily accessible manner to meet the changing needs of our program managers. To address this need, we have strengthened our planning and support for current and future financial system requirements. During FY 1999, the Department implemented enhancements to our Executive Information System, the Financial Data Warehouse, and the Functional Cost Reporting System which will improve accessibility to financial data and reports.

To meet future system needs, we launched a project to design, develop, and implement a new Business Management Information System – Financial Management (BMIS–FM). In conjunction with these efforts, the Department is working to formulate more quantifiable performance measures for relating managerial cost accounting information to program outputs. We now anticipate implementation of our future financial management system in 2003 based on current requirements and projected funding. Our second area requiring improvement is the Western Area Power Administration's newly implemented accounting system. This system was implemented in early FY 1999 and has operational problems. An overall corrective action plan has been developed and a project manager has been charged with implementing the necessary actions to make this system compliant during FY 2000.

In FY 2000, the Office of Chief Financial Officer acquired a new important responsibility to oversee the project management activities of the Department. We have established the Office of Engineering and Construction Management which will help ensure that the Department's many construction and environmental remediation projects are run in a more disciplined and efficient manner.

The Department continues to make financial management improvements in response to new requirements which challenge us to become more efficient, effective, and accountable. These changes demand increasing diligence, dedication, and the productive use of all our resources to ensure that the Department effectively supports its program goals, while also maintaining its financial responsibility to the American taxpayer, the Congress, and the President. Our current financial initiatives are critical to achieving our Departmental missions and goals in an effective and efficient manner. We appreciate the support of the President and the Congress in these efforts.

A handwritten signature in black ink, reading "Michael L. Telson".

Michael L. Telson

Financial Overview

The financial overview section is intended to provide a concise description of the Department of Energy's financial position and the results of financial performance measures.

Balance Sheet

The Department prepares consolidated financial statements that include a Balance Sheet, a Statement of Net Cost, a Statement of Changes in Net Position, a Statement of Budgetary Resources, a Statement of Financing, and a Statement of Custodial Activity. Overall, these statements summarize the financial activity and financial position of the Department. The following table highly summarizes these statements and provides a quick overview of significant balances:

Assets	(Dollars in Billions)	
	9/30/99	9/30/98
Fund Balances with Treasury	\$11.5	\$11.2
Primarily appropriated funds to pay current liabilities and finance authorized purchase commitments.		
Investments	10.7	10.5
Primarily monies managed for the Nuclear Waste Fund and the Uranium Enrichment Decontamination and Decommissioning Fund. Fees paid by owners and generators of spent nuclear fuel and high-level radioactive waste, and fees collected from domestic utilities are deposited in the respective funds to pay current program costs, with any excess funds invested in Treasury securities.		
Accounts Receivable	5.0	5.0
<i>Intragovernmental</i> —Primarily for reimbursable work performed for other Federal agencies.		
<i>Governmental</i> —Primarily for Nuclear Waste Fund and Uranium Enrichment Decontamination and Decommissioning Fund fees.		
Inventory Materials	37.7	37.3
Crude oil at the Strategic Petroleum Reserve, Nuclear Materials, and Other Inventory		
General Property, Plant and Equipment	18.5	19.8
Includes over 126 million square feet of buildings located on over 2.6 million acres of land.		
Regulatory Assets	12.9	13.3
Associated with the Department's power generation and management responsibilities. These assets represent the Bonneville Power Administration's (BPA) right to future revenues generated from non-Federal power generator projects in return for BPA's payment of debt issued to complete these projects.		
Other Assets	1.5	0.8
Total Assets	\$ 97.8	\$ 97.9

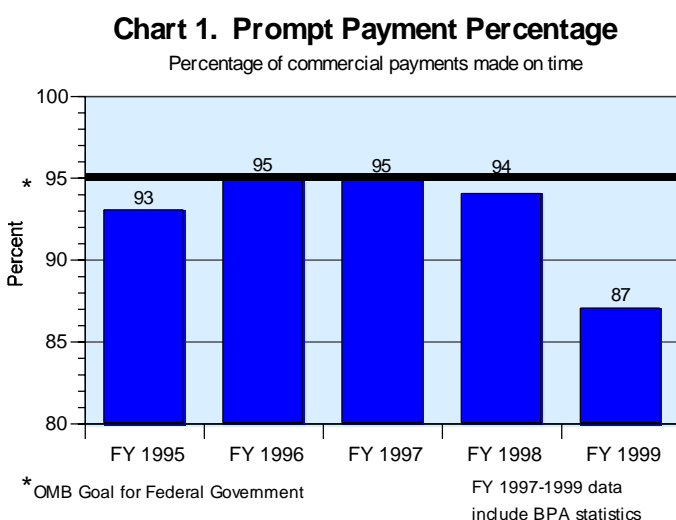
		(Dollars in Billions)	
		9/30/99	9/30/98
Liabilities			
Environmental Liabilities		\$ 230.6	\$ 185.9
Represents the Department's obligation to correct the environmental damage incurred throughout the DOE complex while researching, producing, and testing nuclear weapons.			
Debt and Appropriated Capital Owed to Treasury		17.6	17.9
Represents amounts which the Department has obligations to pay for borrowing from Treasury, refinanced appropriations, and non-federal projects.			
Accounts Payable		3.1	3.3
<i>Intragovernmental</i> —Includes liability for accrued expenses and interest.			
<i>Governmental</i> —Includes contract holdbacks and accrued expenses.			
Pensions and Other Actuarial Liabilities		6.7	6.5
Represents amounts which the Department has obligations to pay for specified benefits to contractor employees having approved defined benefit pension plans and post-retirement benefits other than pensions.			
Other Liabilities, Including Deferred Revenues		17.9	16.6
Primarily, represents the amount of Nuclear Waste Fund revenues that exceed the Nuclear Waste Fund expenses and DOE's unfunded environment, safety, and health liability. Nuclear Waste Fund revenues are accrued based on fees assessed against owners and generators of high-level radioactive waste and spent nuclear fuel and are recognized as costs are incurred for Nuclear Waste Fund activities. The environment, safety and health liability represents those activities necessary to bring facilities and operations into compliance with existing laws and regulations.			
Total Liabilities		\$ 275.9	\$ 230.2
Beginning Net Position		(\$ 132.3)	(\$125.0)
Net Costs of Programs		(32.1)	(21.0)
	1999	1998	
Energy Resources (Includes \$2.8 net gain on sale of NPR-1)	1.6	(\$ 1.1)	
National Security	5.3	5.7	
Environmental Quality	0.6	0.2	
Science and Technology	2.6	2.5	
Corporate Management and Other Programs	0.3	0.3	
Total Business Line Costs	10.4	7.6	
Costs Not Assigned to Programs			
(Includes \$10.1 environmental liability adjustment)	21.7	13.4	
Financing Sources		17.5	13.4
Represents appropriations used, taxes, imputed financing, and transfers.			
Other Adjustments/Changes to Results of Operations		(31.2)	0.3
Represents prior period adjustments, change in Nuclear Waste Fund deferred revenues, and decreases in unexpended appropriations.			
ENDING NET POSITION		(\$178.1)	(\$132.3)
TOTAL LIABILITIES AND NET POSITION		\$97.8	\$97.9

More detailed explanations of these and other balances on the statements are included in the Notes to the Financial Statements.

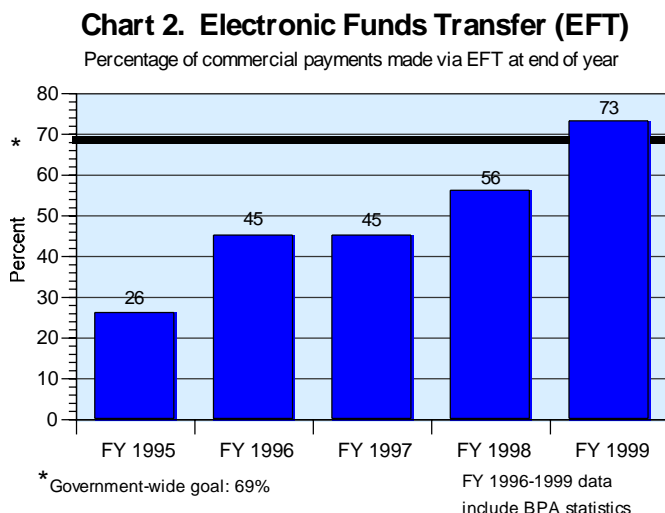
Financial Performance Measures

Payment Performance

Prompt Payment. The Department is committed to meeting goals established by the Office of Management and Budget for on-time payments made by Federal agencies. Chart 1 displays the Federal Government's prompt payment goal and the Department's performance for FY 1995-FY 1999. The Department's FY 1999 on-time payment performance was 87 percent, indicating a decrease from the FY 1998 performance. This decrease resulted primarily from problems with the new accounting system at the Western Area Power Administration. The Department is taking actions to meet the Government-wide goal in future years.



Electronic Funds Transfer. The Debt Collection Improvement Act of 1996 requires the use of Electronic Funds Transfer (EFT) for all Federal payments made after January 1, 1999, with limited exceptions. The results portrayed in Chart 2 demonstrate the Department's continued efforts to implement the Government-wide mandate to utilize EFT for payments. The Department's percentage of commercial payments made by EFT as of September 30, 1999, is 73 percent, which exceeds the Government-wide goal of 69 percent for all Federal payments. The Department is continuing its efforts to improve performance in this area and hopes to remain a Government leader in utilizing EFT.

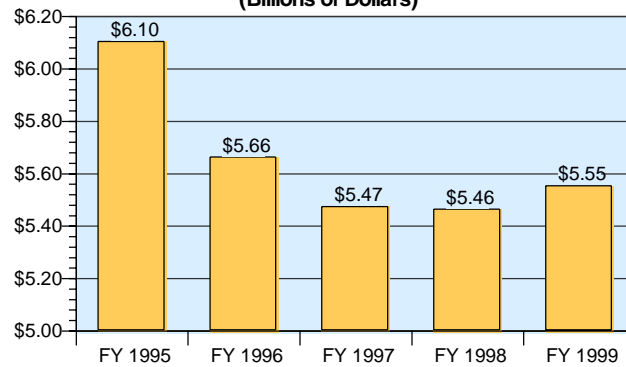


Reducing Functional Support Costs

Over the past several years the Department has made significant progress in controlling functional support costs across the complex. Functional support activities are required to be performed, but are not directly tied to mission activities and do not include the costs of capital equipment and construction. Examples of functional support activities include: maintenance, procurement, information/outreach services, safeguards and security, financial services, and safety and health. The Department implemented a reporting system in FY 1997 to compile, analyze, and monitor functional support costs provided by the Department's major contractors. Since last year, three separate contractor submissions (Hanford, Bechtel Hanford, and Pacific Northwest National Laboratory) have been consolidated into one reporting site (Hanford) for purposes of this report. Also, two additional sites (Ames Laboratory and Fermi National Accelerator Laboratory) have submitted functional support cost data for the FY 1995 through FY 1999 timeframe and are included in the FY 1999 report.

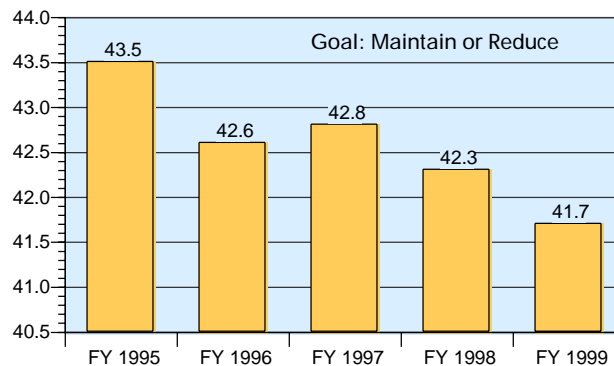
This reporting system accumulates data on functional support costs for FY 1995 through FY 1999. In FY 1999, improvements were made in the system, resulting in more accurate identification of cost. In order to maintain consistency, the data reported previously were adjusted consistent with the FY 1999 improvements. Charts 3 and 4 display the trend as the Department focuses to control and monitor its functional support costs.

Chart 3. Functional Support Costs of 23 Major Contractor Sites (Billions of Dollars)



Costs have been estimated based on subsequent years actual costs for FY 1995 at Argonne National Lab site.

Chart 4. Functional Support Costs as a Percentage of Total Costs for 23 Major Contractor Sites

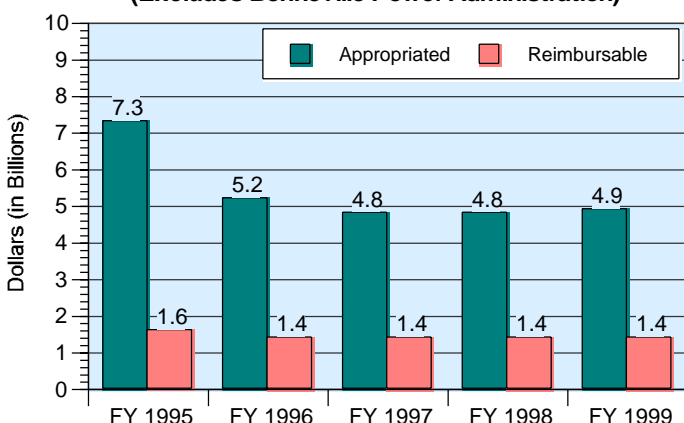


Balances of Uncosted Obligations and Unobligated Appropriations

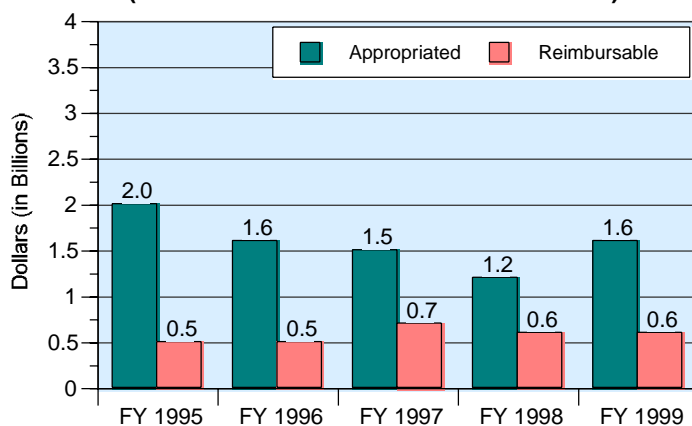
Significant balances of uncosted obligations occur when a Federal agency contracts out much of its appropriated funds, as does the Department. These uncosted balances represent the portion of contract obligations related to goods and services which have not yet been received. While balances of uncosted obligations are natural and acceptable, it is incumbent upon Federal agencies to evaluate these balances to ensure that the levels maintained are appropriate and consistent with good financial management.

As reflected in Charts 5 and 6, the Department has taken aggressive actions to understand what drives uncosted obligation balances, control and reduce these balances, and more actively consider these resources when determining budget estimates. Most notably, in FY 1996, the Department developed and has continued to refine a comprehensive methodology for analyzing uncosted

**Chart 5. Uncosted Obligations by Fiscal Year
(Excludes Bonneville Power Administration)**



**Chart 6. Unobligated Appropriations by Fiscal Year
(Excludes Bonneville Power Administration)**



balances. This methodology established dollar level thresholds which are consistent with sound financial management for specific types of financial/contractual arrangements allowing the Department to evaluate its overall performance based on the variance between the calculated thresholds and actual balances. Additionally, the Department has charted progress in reducing unobligated appropriations balances to ensure that excess uncosted balances are being eliminated rather than recategorized. The results of these internal evaluations indicate that since FY 1997, the Department has been operating at or near optimum uncosted levels. This follows a steady decline in balances which started in FY 1993 coupled with a similar trend in unobligated balances during that same time frame. (NOTE: Charts 5 and 6 exclude data for the Bonneville Power Administration, which is treated as a Government Corporation.)

Results of System Evaluation

The Department conducted an evaluation of its accounting system in accordance with Office of Management and Budget guidance. The evaluation disclosed two nonconformances with Federal financial management systems standards as discussed below.

Financial Management Systems

The Department's missions, and its business environment, have changed dramatically over the last several years. As a result, the Department's financial systems no longer provide the financial information necessary to assist program officials in their financial decision making. In addition, Congress and regulatory Agencies have enacted significant new financial requirements which will lead to a more accountable Government. Besides the changing environment and new requirements, the Department's main financial systems are about 20 years old. Upgrades are becoming almost impossible and compatibility with other software and hardware is increasingly becoming a problem. To address these issues, the Office of Chief Financial Officer has strengthened and increased its commitment to meet the needs of management and new requirements for a more accountable Government.

Major efforts were initiated in FY 1999, and will continue in FY 2000, to expand and improve data accessibility and reporting through the Financial Data Warehouse and Executive Information System, which the Department deployed in FY 1998. In addition, the Department is in the second phase of obtaining a complete, new financial information system. The effort to design, develop and implement a new business management information system was initiated and the first major OMB requirement, which is to develop a business case, is completed. The result of this first phase was the report *Business Management Information System – Financial Management (BMIS-FM) Business Case*, which was approved and published in FY 1999. During FY 1999 and continuing into FY 2000 the Department will identify functional and technical system requirements, select a commercial off-the-shelf software package for the core financial system, and award a contract for sufficient software licenses to begin a pilot. Full implementation of BMIS-FM is planned for Fiscal Year 2003.

Western Area Power Administration Financial System

Early in FY 1999, Western Area Power Administration implemented a new financial management system. Due to resource constraints, the new system was not run parallel with the old one to ensure that it met existing requirements. After implementation, Western identified several areas where the new system does not conform to Government-wide requirements. Areas of concern include management reporting, funds control, documentation, internal controls, and user training.

During FY 1999, Western acquired outside consulting services to review their system implementation efforts and to recommend actions to resolve the areas of non-conformance. Based on the results of this review, Western developed a detailed action plan, designated a project manager, and established a comprehensive team of both Federal and non-Federal system experts to execute the plan. Western intends to be in conformance in FY 2000.

Mapping of Legal Requirements

Page

Government Management Reform Act

Report Sections

Overview	3
Financial Overview	45
Inspector General's Opinion	55
Financial Statements	77

Government Performance and Results Act

Report Sections

Overview	3
Detailed Performance Results	131

Federal Managers' Financial Integrity Act

Report Sections

Message From the Secretary	1
Overview	3
Message From the Chief Financial Officer	44
Results of the System Evaluation	50

Inspector General Act

Report Sections

Management's Response to Inspector General Audit Reports	42
--	----

Clinger-Cohn Act

Report Sections

Detailed Performance Results (CM5-1)	170
--	-----

Reference Index

	<i>Page</i>
Detailed Performance Results (GPRA Reporting)	131
Energy Resources	132
National Security	140
Environmental Quality	151
Science and Technology	155
Corporate Management	163
DOE At a Glance	5
DOE Business Lines	8
Energy Resources	8
National Security	13
Environmental Quality	21
Science and Technology	27
Corporate Management	33
Financial Overview	45
Highlights of Balance Sheet	45
Financial Performance Measures	47
Payment Performance	47
Functional Support Costs	48
Balances of Uncosted Obligations and Unobligated Appropriations	49
Results of System Evaluation	50
Financial Management System	50
Western Area Power Administration	50
Financial Statements	77
Principal Statements:	78
Balance Sheet	78
Statement of Net Costs	79
Statement of Changes in Net Position	80
Statement of Budgetary Resources	80
Statement of Financing	81
Statement of Custodial Activity	82
Notes to the Financial Statements	83
Consolidating Schedules	118
Required Supplemental Information	123
Deferred Maintenance	124
Required Supplementary Stewardship Information	125
Research and Development	126
Intra-governmental Assets and Liabilities	130
FMFIA Reportable Items	
Management Control Attestation	1
Financial System Attestation	44
Summary of Departmental Challenges (FMFIA)	43
Security	17
Surplus Fissile Materials	19
Environmental Compliance	22

Permitting Issues at Waste Isolation Pilot Plant	24
Nuclear Waste Disposal	25
Safety and Health	34
Mission Critical Staffing	36
Contract Mangement	37
Project Management	38
Inadequate Audit Coverage	39
Inspector General's Audit Report	53
Memorandum From the Inspector General	55
Inspector General's Report on DOE's Financial Statements	57
Inspector General's Report on Internal Controls	61
Inspector General's Report on Compliance with Laws and Regulations	73
Management's Response to Inspector General Audit Reports	42
Map of DOE Major Facilities	6
Message From the Chief Financial Officer	44
Message From the Secretary	1
Year 2000 Status	41